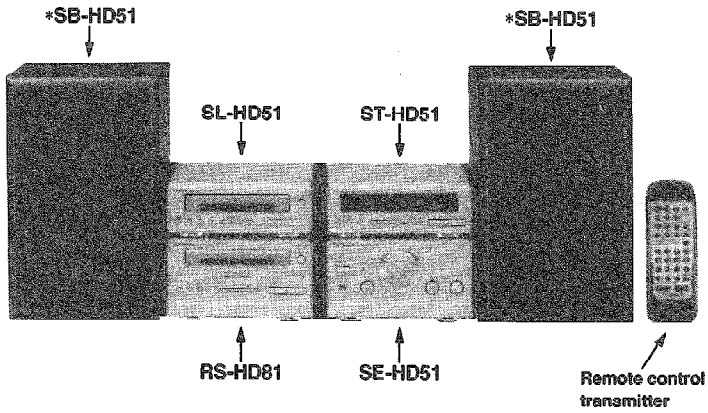
ORDER NO. AD9803047C2

Service Manual

CD Player

CD Player

SL-HD51



Colour

(N) ..... Gold

Area

E ..... Europe.

COMPACT disc DIGITAL AUDIO MASH *1 multi-stage noise shaping

System : SC-HD51

Because of unique interconnecting cables, when a component requires service, send or bring in the entire system.

RAE0152Z MECHANISM SERIES

Specifications

Audio

DA converter: 1 bit 2 DAC MASH *1

Pickup

Wavelength: 780 nm

General

Dimensions: 196(W)/67(H)/228(D) mm
Weight: 1.3 kg

Notes:
1. Specifications are subject to change without notice.
2. Weight are dimensions are approximate.

*1 MASH is a trademark of NTT

System/SC-HD51:
Tuner: ST-HD51, **Compact Disc Player: SL-HD51**, Amplifier: SE-HD51, Cassette Deck: RS-HD81, Speakers: *SB-HD51
Notes: *..... Made in PAES

⚠WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

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Technics®

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NOTE:

Refer to the service manual for Model No. SE-HD51 (ORDER No. AD9802031C2) for information on "Accessories", "Installation", "Connections" and "Packaging".

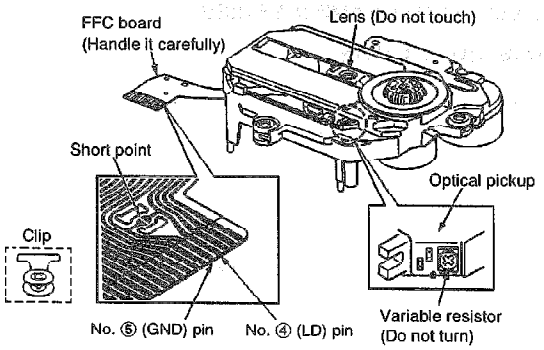
CAUTION:
THIS PRODUCT UTILIZES A LASER.
USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

Handling Precautions for Traverse Deck

The laser diode in the traverse deck (optical pickup) may break down due to potential difference caused by static electricity of clothes or human body. So, be careful of electrostatic breakdown during repair of the traverse deck (optical pickup).

● Handling of traverse deck (optical pickup)

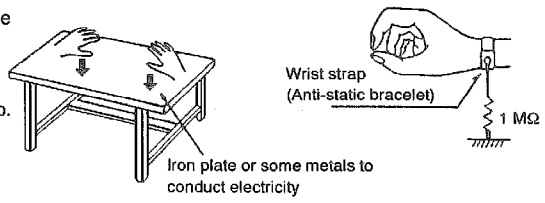
1. Do not subject the traverse deck (optical pickup) to static electricity as it is extremely sensitive to electrical shock.
2. To protect the laser diode against electrostatic breakdown, short the flexible board (FFC board) with a clip or similar object.
3. Take care not to apply excessive stress to the flexible board (FFC board).
4. Do not turn the variable resistor (laser power adjustment). It has already been adjusted.



● Grounding for electrostatic breakdown prevention

1. Human body grounding
   Use the anti-static wrist strap to discharge the static electricity from your body.
2. Work table grounding
   Put a conducive material (sheet) or steel sheet on the area where the traverse deck (optical pickup) is placed, and ground the sheet.

Caution:
The static electricity of your clothes will not be grounded through the wrist strap. So, take care not to let your clothes touch the traverse deck (optical pickup).



Caution when Replacing the Traverse Deck:

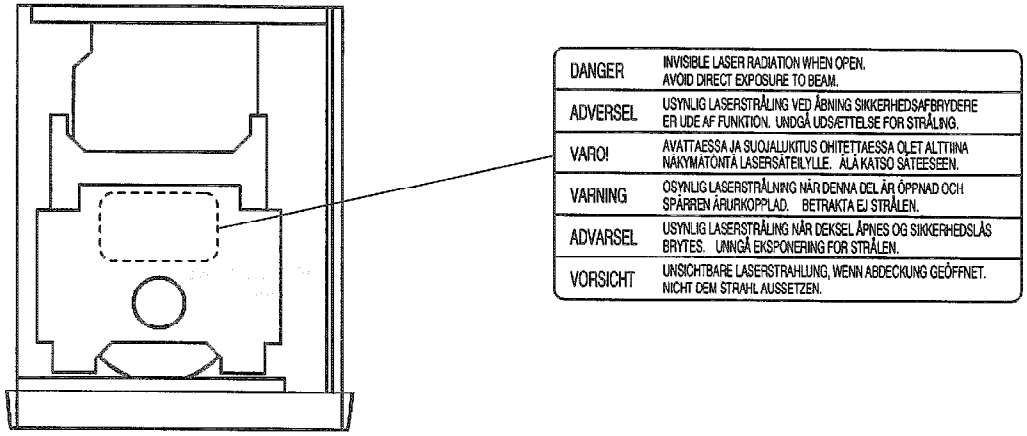
The traverse deck has a short point shorted with solder to protect the laser diode against electrostatic breakdown. Be sure to remove the solder from the short point before making connections.

Precaution of Laser Diode

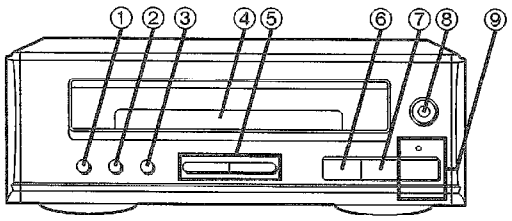
CAUTION: This product utilizes a laser diode with the unit turned "on", invisible laser radiation is emitted from the pick up lens.
Wave length: 780 nm
Maximum output radiation power from pick up: 100 μW/VDE

Laser radiation from the pick up unit is safety level, but be sure the followings:

1. Do not disassemble the pick up unit, since radiation from exposed laser diode is dangerous.
2. Do not adjust the variable resistor on the pick up unit. It was already adjusted.
3. Do not lock at the focus lens using optical instruments.
4. Recommend not to lock at pick up lens for a long time.

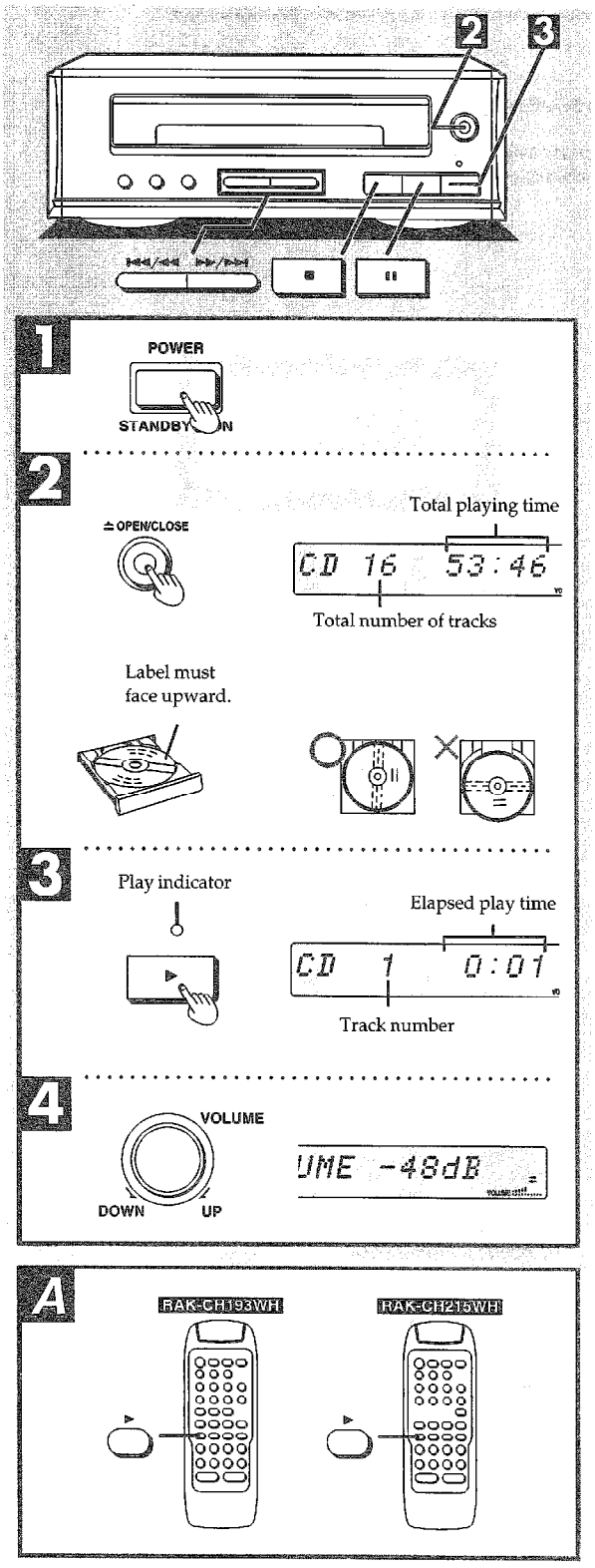

DANGER
INVISIBLE LASER RADIATION WHEN OPEN. AVOID DIRECT EXPOSURE TO BEAM.
ADVERSEL
USYNLIG LASERSTRÅLING VED ÅBNING SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.
VARO!
AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄKYMÄTÖNTÄ LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.
VARNING
OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÅRURKOPPLAD. BETRAKTA EJ STRÅLEN.
ADVARSEL
USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES OG SIKKERHEDSLÅS BRYTES. UNNGÅ EKSPONERING FOR STRÅLEN.
VORSICHT
UNSICHTBARE LASERSTRAHLUNG, WENN ABDECKUNG GEÖFFNET. NICHT DEM STRAHL AUSSETZEN.

Location of Controls



① Random play button (RANDOM)
② Repeat button (REPEAT)
③ AI edit button (AI EDIT)
④ Disc tray
⑤ Skip/search buttons (⏮/◀◀, ▶▶/⏭)
⑥ Stop button (■)
⑦ Pause button (⏸)
⑧ Disc tray open/close button (⏏ OPEN/CLOSE)
⑨ Play button and indicator (▶)

Listening to Compact Disc



Sequential play

1 Switch on the power.

2 Press ≙ OPEN/CLOSE to open the tray.
Set a CD on the tray.
Press ≙ OPEN/CLOSE once again to close the tray.

When the "CD" input source is selected, total number of tracks and total playing time will appear on the display.

Note
The total playing time displayed when a disc is loaded includes intervals between tracks. This is why sometimes the displayed time is longer than that listed on the CD.

3 Press ▶.
Play will start from the first track, and will stop automatically when the last track is finished.

4 Adjust the volume level as you like.

To stop the disc play:
Press ■.

To temporarily stop the disc play:
Press ❚❚. The play indicator flashes up green.
To play again, press ▶.

When "CD NO DISC" display appears:
It indicates that a CD has not been inserted in the tray.

About play indicator:
While stopped: Lights up orange.
While playing: Lights up green.

For your reference:
If you press ▶ instead of ≙ OPEN/CLOSE after setting a CD, the tray will close and play will start directly from the track 1.

To search forward/backward:
Available only from the main unit
Hold down ⏮/◀◀ or ▶▶/⏭ during playback.
▶▶/⏭: To search forward
⏮/◀◀: To search backward

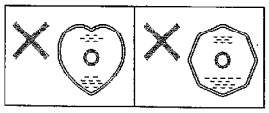
To skip forward/backward:
Press ⏮/◀◀ or ▶▶/⏭.
▶▶/⏭: To skip forward
⏮/◀◀: To skip backward

Note
During random play, you can not skip to tracks which have already been played out.

For your reference:
- During program play or random play, you can search-forward/backward only within the current track.
- During program play, skipping is always in the programmed order, whether forward or backward.

One-touch play A
When the system is OFF, playing starts automatically when you press ▶ on the remote control.
The play will start with volume increasing gradually.

Note
- Do not use CDs with poorly attached labels or stickers.
  Adhesive protruding from underneath stickers or left over from peeled off stickers can cause your system to malfunction.
- Do not use irregular shape CDs (heart-shape, octagonal, etc.).



Operation Checks and Main Component Replacement Procedures

NOTE

1. This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.
2. For reassembly after operation checks or replacement, reverse the respective procedures. Special reassembly procedures are described only when required.
3. Select items from the following index when checks or replacement are required.
4. Refer the parts No. on the page of "Main Component Replacement Procedures", if necessary.

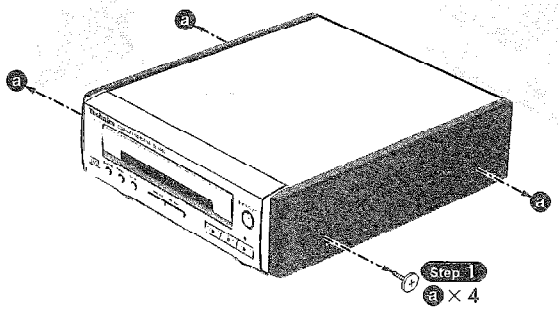
• Contents

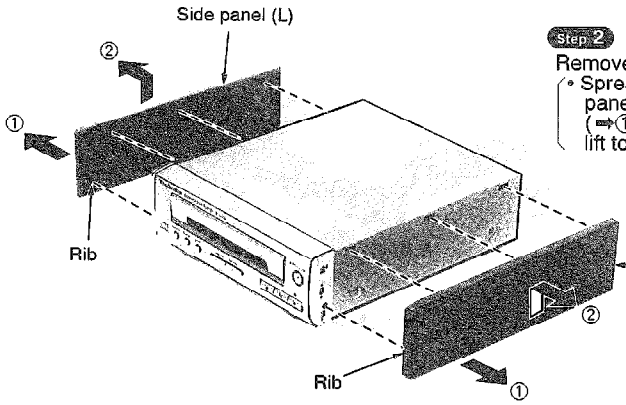
• Checking Procedures for each P.C.B. Page.
1.Checking for the main P.C.B.. ..... 5,6.
2.Checking for the CD servo P.C.B.. ..... 7.

• Main Component Replacement Procedures
1. Replacement for the traverse deck ass'y. ..... 7~11.
2. Replacement for the belt, loading motor ass'y and loading switch. ..... 12.

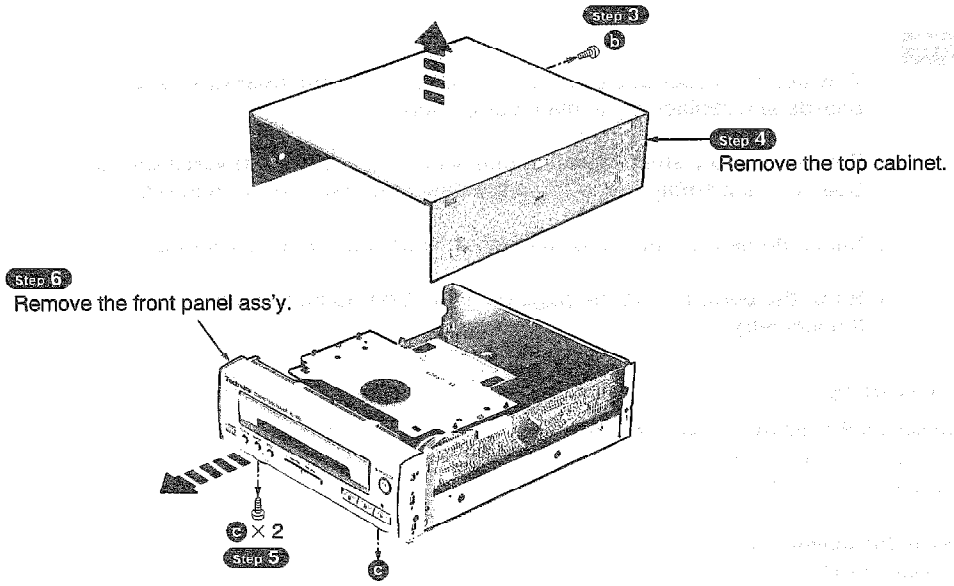
Checking Procedure for each P.C.B.

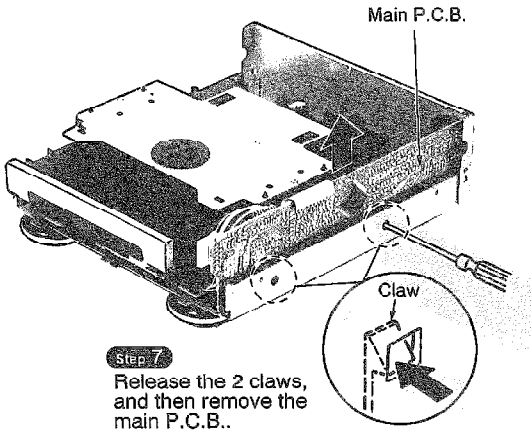
1. Checking for the main P.C.B.

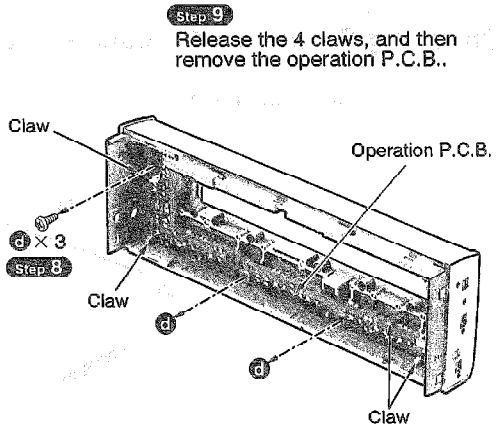




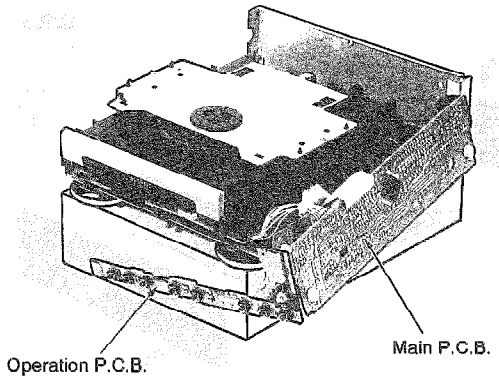
Step 2
Remove the side panel (L),(R).
(• Spread the lower part of the side panels in the direction of arrow (➡①) to release the ribs, and then lift to remove the side panels (➡②).)





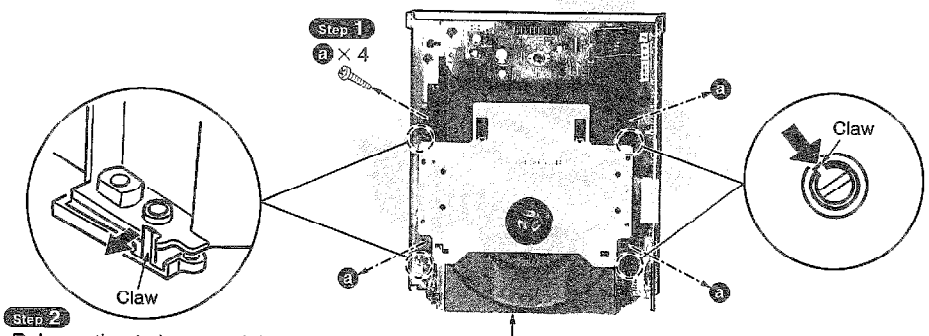


• Check the main P.C.B. as shown below.

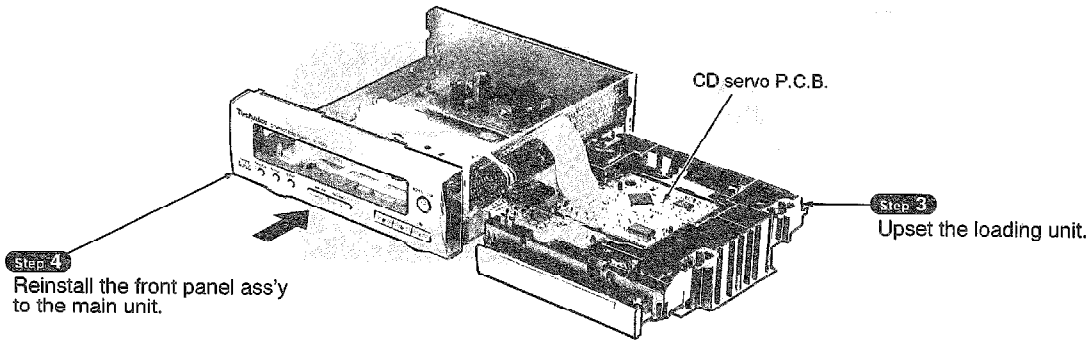


2. Checking for the CD servo P.C.B.

• Follow the Step 1 ~ Step 6 of the item 1 in checking procedure for each P.C.B. on pages 5 and 6.



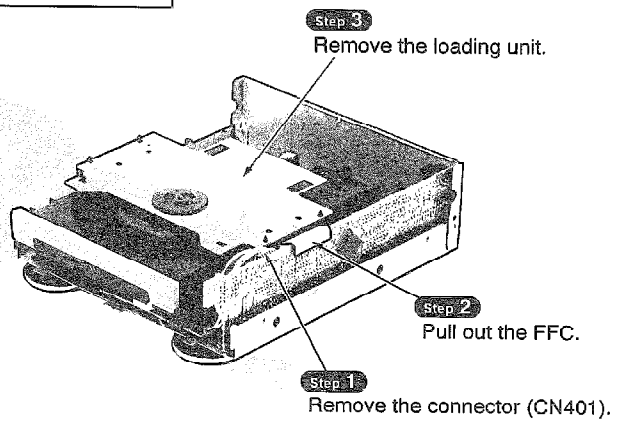
• Check the CD servo P.C.B. as shown below.

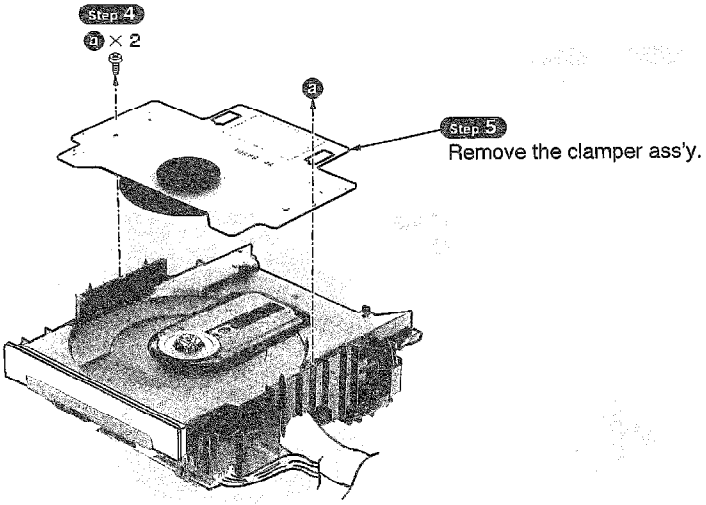


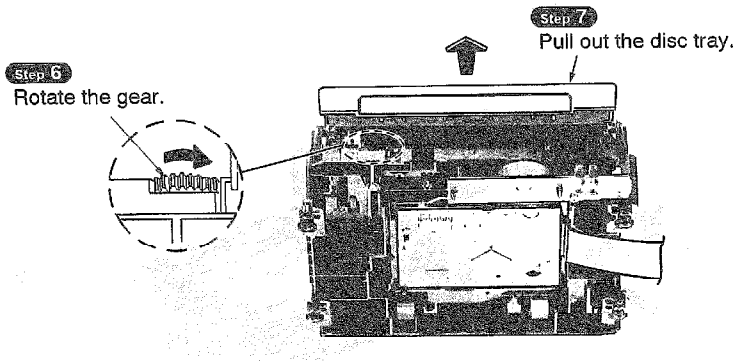
Main Component Replacement Procedures

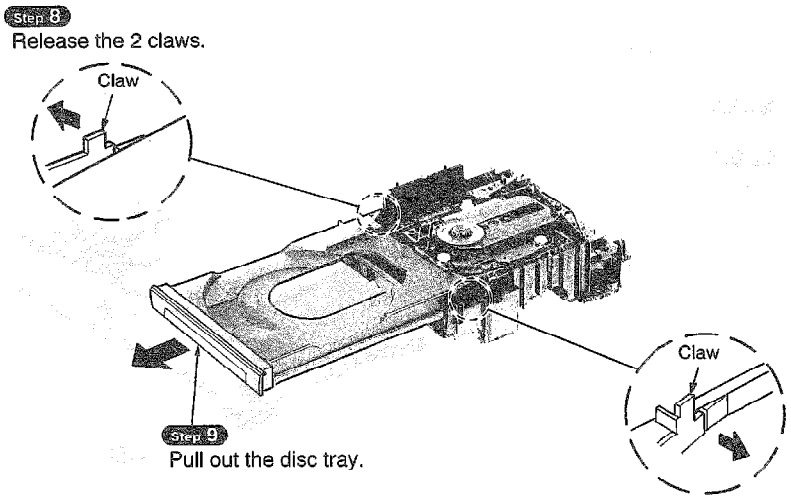
1. Replacement for the traverse deck ass'y

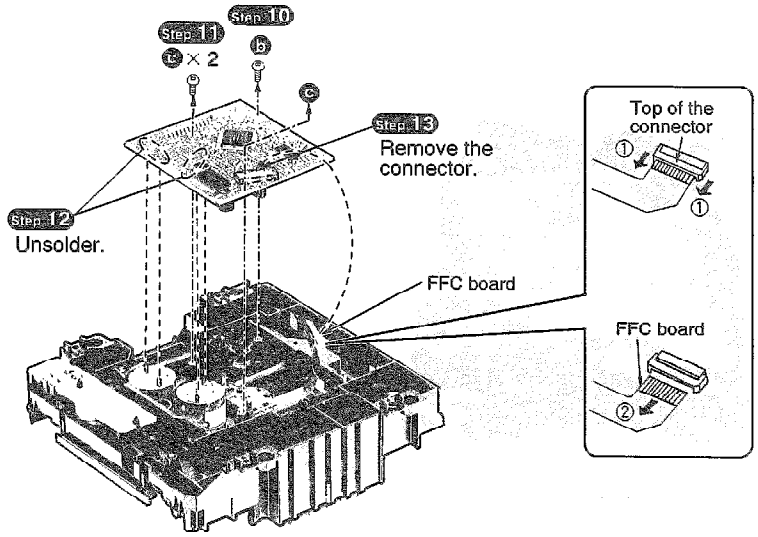
• Follow the Step 1 ~ Step 6 of the item 1 in checking procedure for each P.C.B. on pages 5 and 6.
• Follow the Step 1 , Step 2 of the item 2 in checking procedure for each P.C.B. on page 7.



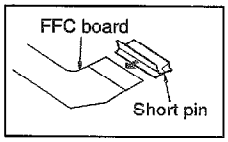

Step 4
d × 2
a
Step 5
Remove the clamper ass'y.

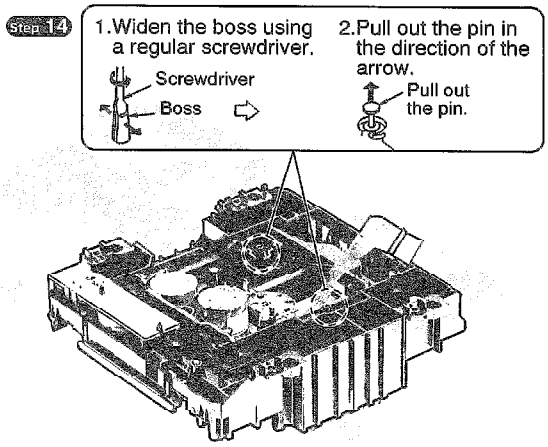

Step 7
Pull out the disc tray.
Step 6
Rotate the gear.

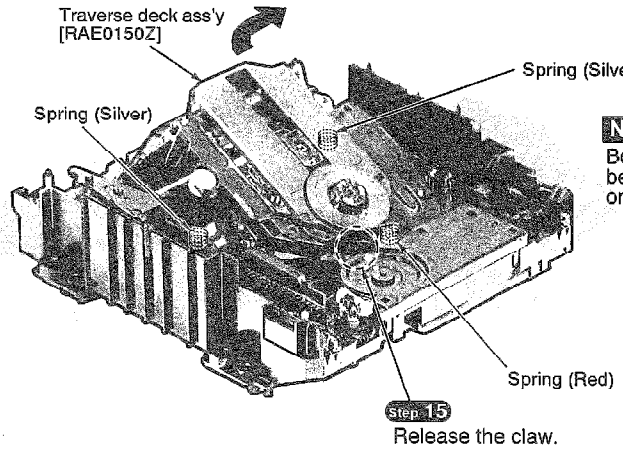

Step 8
Release the 2 claws.
Claw
Claw
Step 9
Pull out the disc tray.



Caution:
Insert a short pin into the traverse unit FFC board.
(Refer to "Handling Precautions for Traverse Deck" on page 4.)

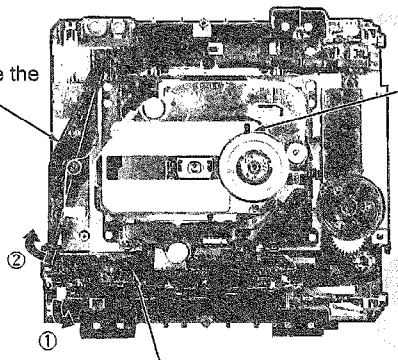


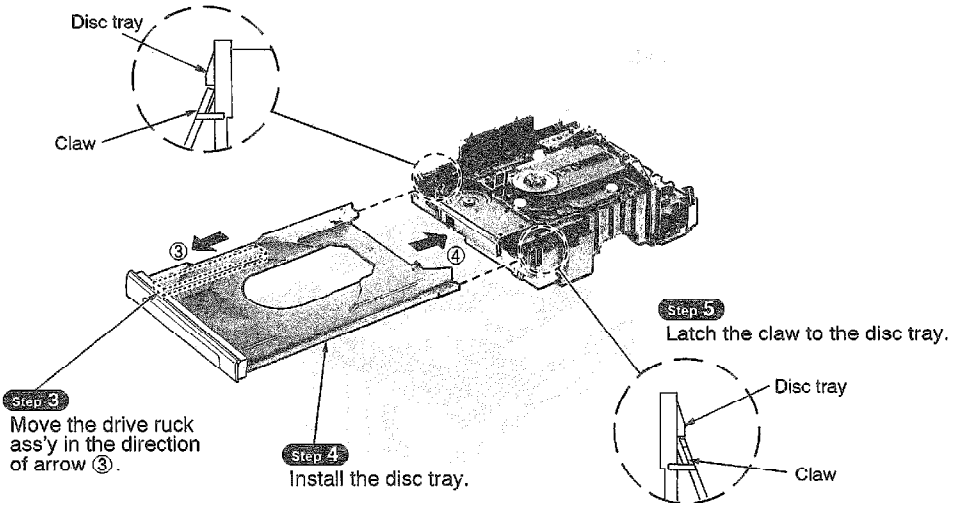

Step 14
1.Widen the boss using a regular screwdriver.
Screwdriver
Boss
2.Pull out the pin in the direction of the arrow.
Pull out the pin.

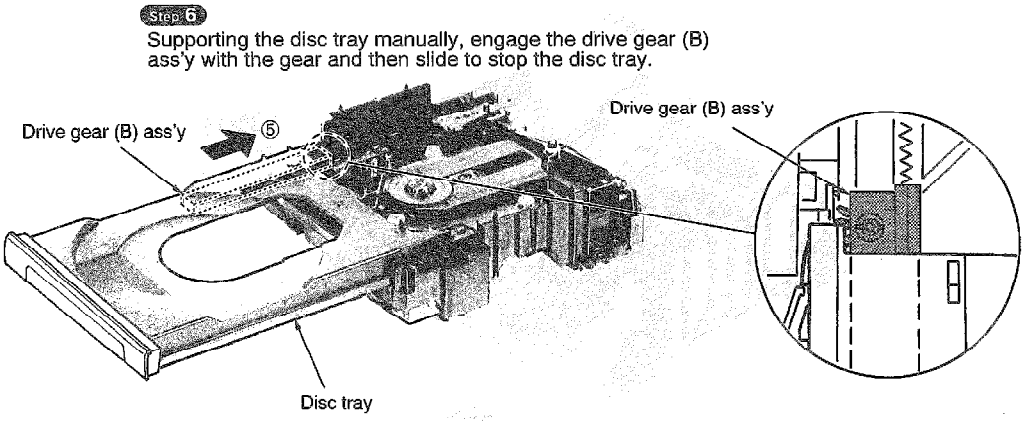


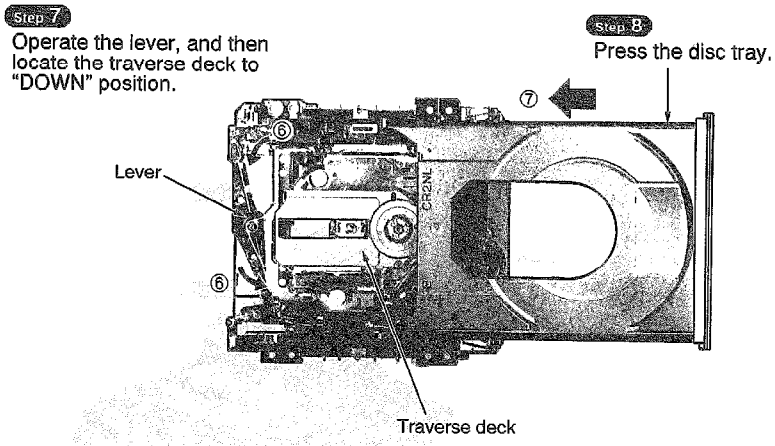
NOTE
Be careful not to lose the 3 springs because those will also be removed on removal of the traverse deck ass'y.

Installation of the disc tray after replacement

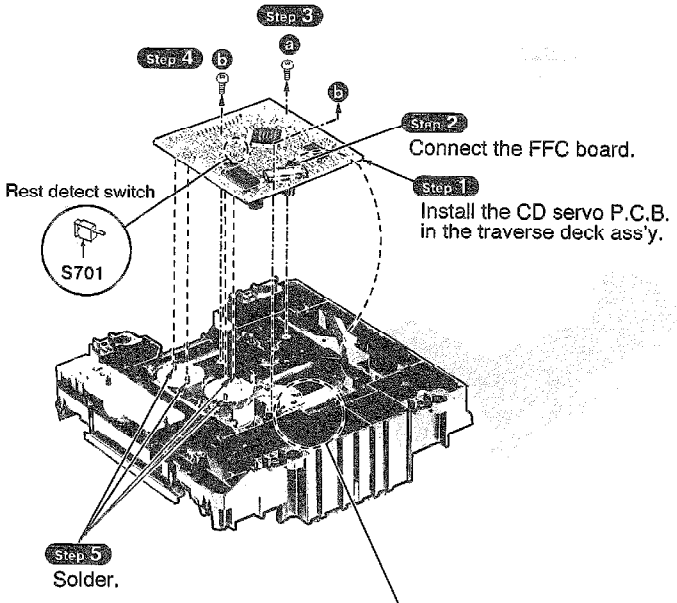


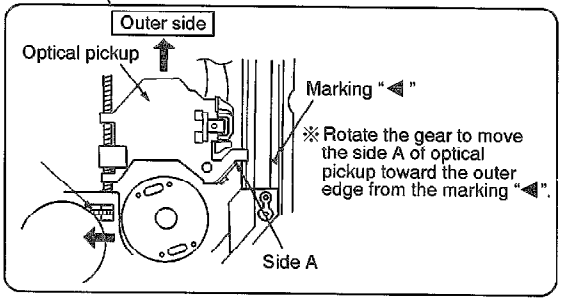



Step 6
Supporting the disc tray manually, engage the drive gear (B) ass'y with the gear and then slide to stop the disc tray.
Drive gear (B) ass'y
⑤
Drive gear (B) ass'y
Disc tray



Installation of the CD servo P.C.B. after replacement



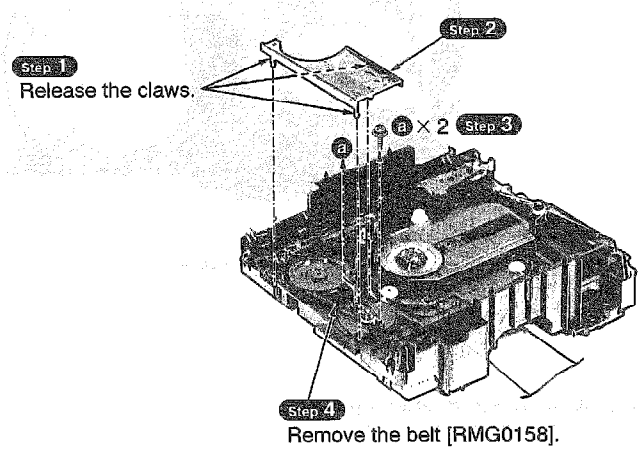

Outer side
Optical pickup
Marking "◀"
※Rotate the gear to move the side A of optical pickup toward the outer edge from the marking "◀".
Side A

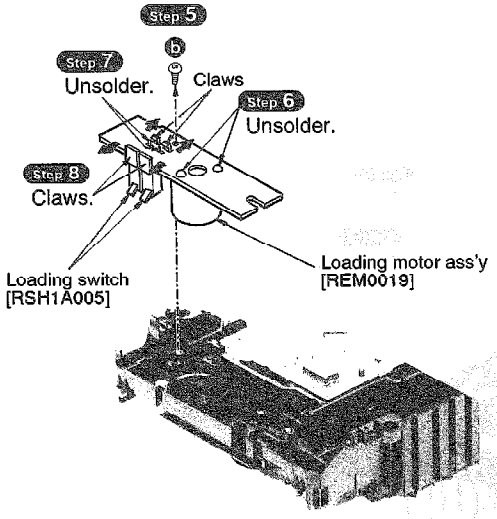
NOTE

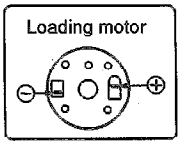
Before installing the CD servo P.C.B., move the optical pickup toward the outer edge from the mark "▼". [Otherwise, the rest detect switch (S701) mounted on the CD servo P.C.B. may be damaged.]

2. Replacement for the belt, loading motor ass'y and loading switch

- Follow the Step 1 ~ Step 6 of the item 1 in checking procedure for each P.C.B. on pages 5 and 6.
- Follow the Step 1 , Step 2 of the item 2 in checking procedure for each P.C.B. on page 7.
- Follow the Step 1 ~ Step 9 of the item 1 in main component procedures on pages 7 and 8.







To Supply Power Source

Cautions:
- It is very dangerous to look at or touch the laser beam. (Laser radiation invisible.)
  With the unit turned "on", laser radiation is emitted from the pickup lens.
- Avoid exposure to the laser beam, especially when performing adjustments.

This unit SL-HD51 is designed to operate on power supplied from the Amplifier SE-HD51 through the Tuner ST-HD51. When connecting the unit to other system components, do not connect to the Amplifier SE-HD51 directly. Be sure to connect this unit through the Tuner ST-HD51.
When operating the unit SL-HD51 alone for testing and servicing, without having power supplied from the Amplifier SE-HD51 and the Tuner ST-HD51, use the following method.

Power Supply to This Unit Alone

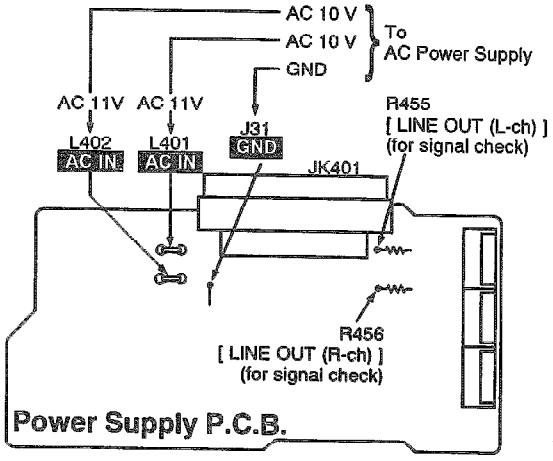
1. Short-circuit the section AC IN (L401), GND (J31) and AC IN (L402).
2. AC 11 V supply to the short point just now.

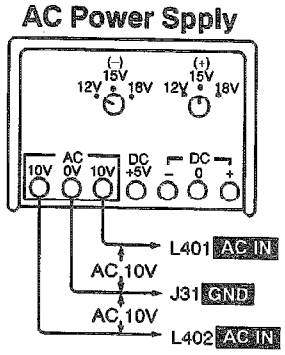
Operate to This Unit Alone

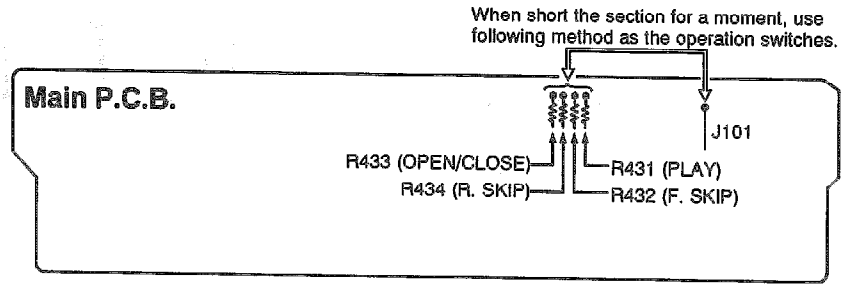
- If this unit SL-HD51 operates by alone, become to not operate the operation switches of the front panel.
  Therefore use following method as the operation switches.
  When short the section following points for a moment, be able to operate as follows.
  short the section between **R431** and **J101** ..... **PLAY**
  short the section between **R432** and **J101** ..... **F. SKIP**
  short the section between **R433** and **J101** ..... **OPEN/CLOSE of the Disc Tray**
  short the section between **R434** and **J101** ..... **R. SKIP**

To Check Signals

Connect the oscilloscope or the speaker with built-in amplifier to the section between **R455 [LINE OUT (L-ch)]** and the **J31** (GND), as well as the section between **R456 [LINE OUT (R-ch)]** and the **J31** (GND), and check if the signals are outputting from this unit as follow.







Error Code Display and Servo Adjustment Function

This unit has an error code display function, so that if the unit operates incorrectly, the fault is displayed using an error code on the FL display of the tuner (ST-HD51). It also has a servo adjustment function for desplaying the status of servo system functions (Focus, Tracking, CLV Servo) on the tuner's FL display.
The system control IC and FL display are part of the tuner so make sure the system has been connected properly before using three functions. (This unit can be operated independently, although the error code display and servo adjustment functions cannot be used.)
Use these two functions for guidance during fault diagnosis and repair.

Note:
Check beforehand for scratching or soiling of the test disc (SZZP1054C), and soiling or other problems with the pickup lens.

● Error code display procedure

Automatic adjustment results

Turn the power ON and select the CD mode by press the select switch of the tuner

↓

Load the test disc (SZZP1054C).

↓

Hold down the STOP button for at least 2 seconds, and then press the ▶▶/▶▶I (F.SKIP/SEARCH) button for at least 2 seconds while continuing to hold down the STOP button.

↓

A servo section error code is displayed. (See **Table 2.**)
Use this error code display as a guideline for finding the malfunction point in the servo circuitry. If the error code "**E-00**" is displayed, the unit is "OK (No problem)."

Checking the mechanism switches

If there are mechanism errors, mechanism OK/NG error code is displayed. (See **Table 1.**)
This error code can be used diagnose whether or not the mechanism is OK. If there are multiple errors, these can be displayed successively by pressing the F. SKIP button.

↓

Remove the disc and turn the power OFF. (The error code display mode is canceled.)

● Servo adjustment procedure

Turn the power ON and select the CD mode by press the select switch of the tuner

↓

Load the test disc (SZZP1054C).

↓

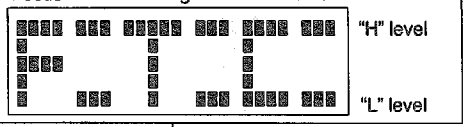
Hold down the STOP button for at least 2 seconds, and then press the ▶▶/▶▶I (F.SKIP/SEARCH) button for at least 2 seconds while continuing to hold down the STOP button.

↓

Press the ▶ (PLAY) button, and play for 10 seconds.

↓

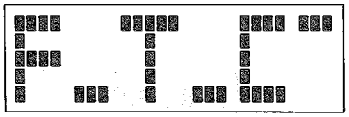
Servo adjustment results are displayed.



↓

Remove the disc and turn the power OFF.

(Example)



⇒ Normal

	"L" level	"H" level
Focus system	normal	defective
Tracking system	normal	defective
CLV servo system	defective	normal

● Table 1

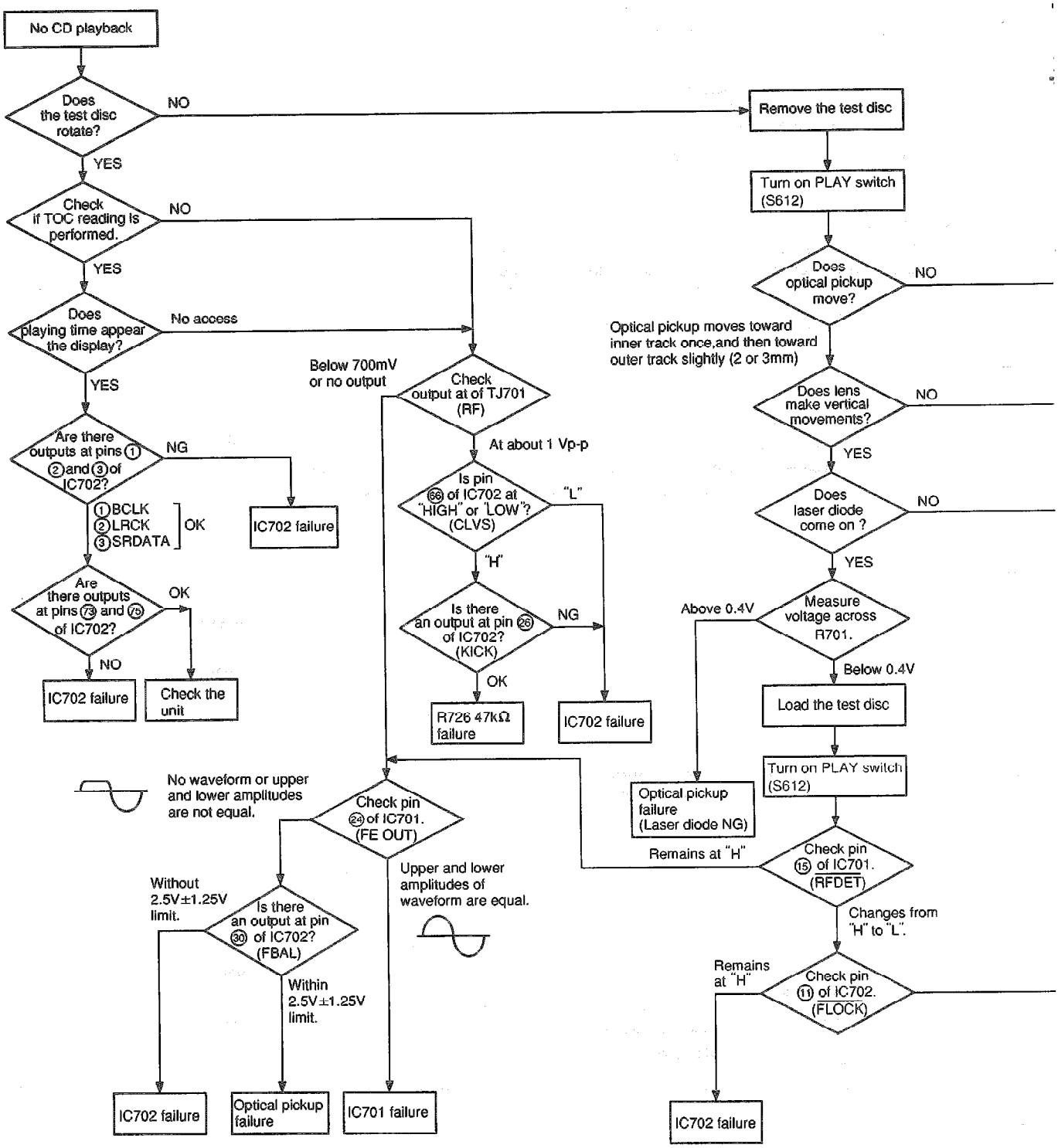
FL display	Symptom	Cause
H-15	When CD tray opens, it closes by itself.	Disc tray "Open" detection switch (S4) fault.
H-16	When CD tray close, it opens by itself.	
F-15	Does not play, even when CD play button is pressed.	Pickup rest position detection switch (S701) fault.
F-16	Traverse pushes up disc tray.	Up position detection switch (S3) fault.
F-26	Does not move even when "▶" (PLAY) button is pressed.	System control or servo processor IC (IC403, IC702) fault.

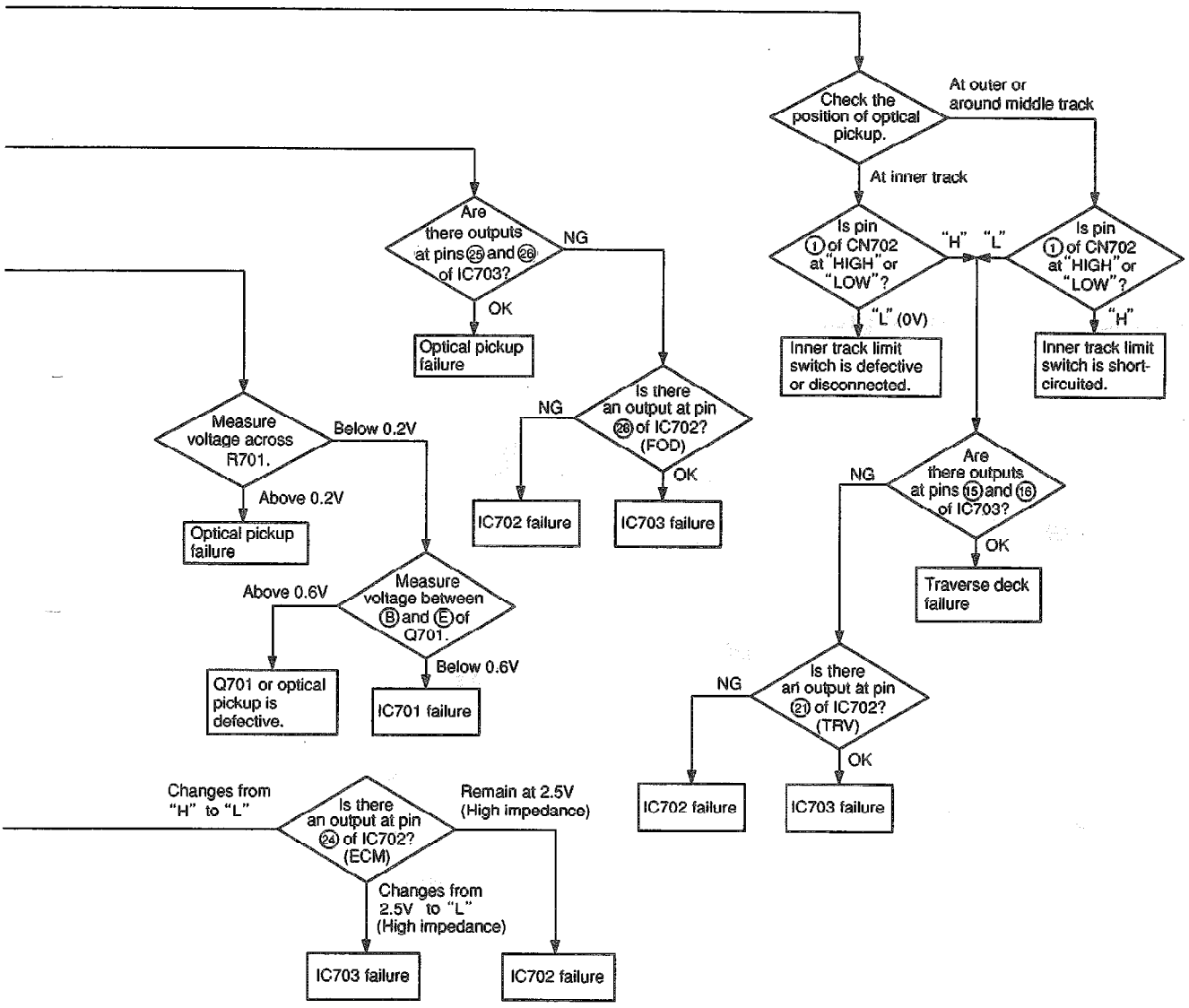
● Table 2

※ The unit is satisfactory if the error code is "E-00" or "E02".
※ Before testing, check that the test disc is free of scratches and optical pickup is clean.

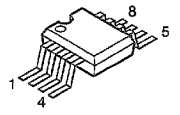
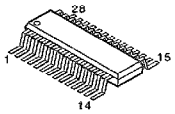
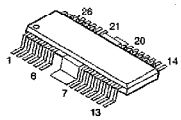
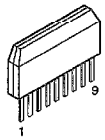
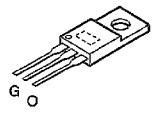
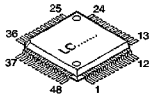
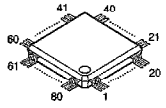
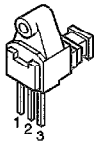
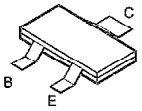
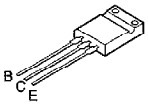
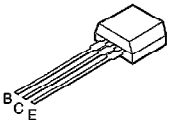
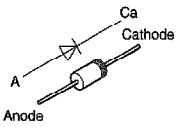
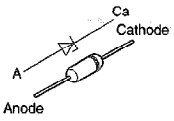
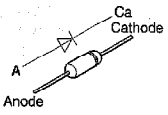
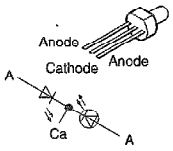
FL error code display	Symptom	Probable cause	Signal to check		Normal voltage and waveform values	
			Location	Signal name	PLAY	STOP
E-01	Focus and tracking offset adjustments not completed in specified time period.	①Clocks X1 and X2, power supply VDD, and reset (/RST), all on IC702. ②MDATA, MCLK, MLD, and SENSE signals to/from mechanism controller.	IC702-8 pin	MDATA	PLAY 5 V 0 V T=13.6 ms.	0 V
			IC702-7 pin	MCLK	PLAY 5 V 0 V T=13.6ms.	4.8 V
			IC702-9 pin	MLD		4.9 V
			IC702-10 pin	SENSE	0 V	0 V
			IC702-18 pin	/RST	4.9 V	4.9 V
			IC702-58 pin	X1	1.9Vp-p F=16.9344 MHz	1.9Vp-p F=16.9344 MHz
			IC702-59 pin	X2	5.6Vp-p F=16.9344 MHz	5.6Vp-p F=16.9344 MHz
E-02 E-03 E-05 E-06 E-07 E-09 E-0A E-0B E-0D E-0E E-0F	Disc play unstable	①Scratches or contaminants on disc surface ②Focus and Tracking servo circuits (check waveforms, voltages, and part values.) ③Spindle driver circuit ④Optical pickup	IC702-32 pin	F E	PLAY 0.3Vp-p 2 ms. 0.1 V/DIV.	2.5 V
			IC702-33 pin	T E	PLAY 0.4Vp-p 2 ms. 0.2 V/DIV.	2.5 V
			IC702-28 pin	FOD	2.5 V	2.5 V
			IC702-27 pin	TRD	2.5 V	2.5 V
			IC702-26 pin	KICK	2.5 V	2.5 V
			IC702-11 pin	/FLOCK	0 V	4.9 V
			IC702-38 pin	/RF DET	0 V	4.9 V
			TJ701	R F	PLAY 1.2 Vp-p 0.5 µs. 0.2 V/DIV	3.9 V
			IC702-17 pin	STAT	4.9 V	0 V
E-04 E-08 E-0C	Focus or Tracking gain adjustment not completed in the specified time period.	①Scratches or contaminants on disc surface ②Focus and tracking servo circuit (check waveforms, voltages, and part values.) ③Optical pickup	IC702-32 pin	F E	PLAY 0.3Vp-p 2 ms. 0.1 V/DIV.	2.5 V
			IC702-33 pin	T E	PLAY 0.4Vp-p 2 ms. 0.2 V/DIV.	2.5 V
			IC702-36 pin	O F T	0 V	0 V
			IC702-12 pin	/TLOCK	0 V	0 V

Troubleshooting Guide

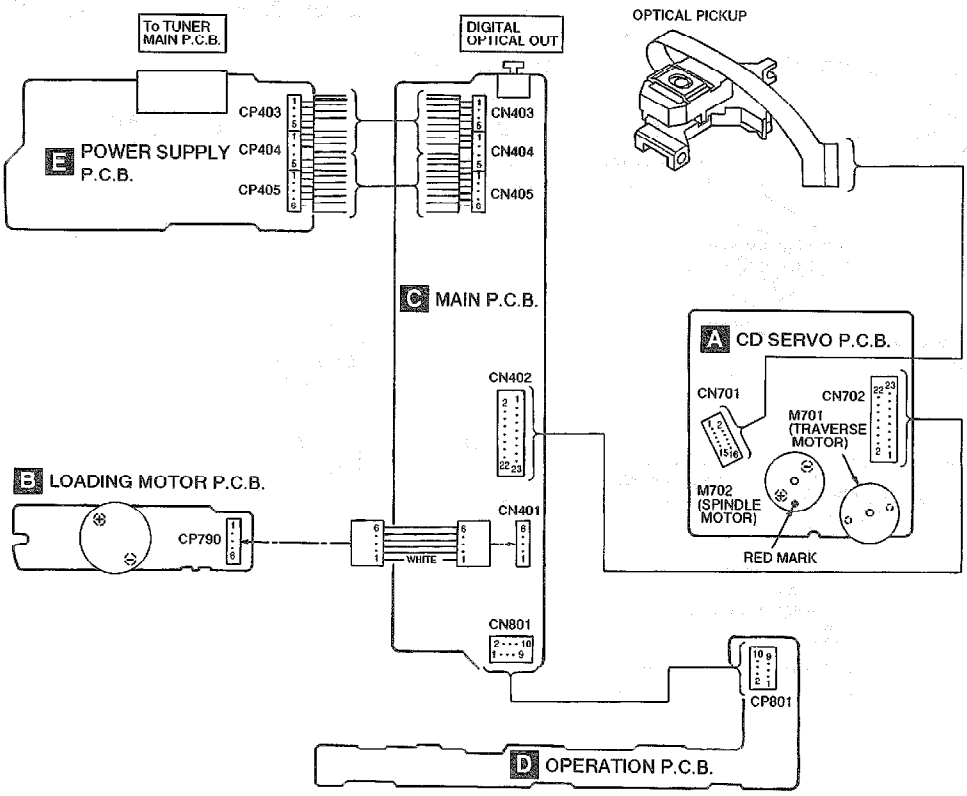



Check the position of optical pickup.
At outer or around middle track
At inner track
Is pin ① of CN702 at "HIGH" or "LOW"?
"H"
"L"
Is pin ① of CN702 at "HIGH" or "LOW"?
"L" (0V)
Inner track limit switch is defective or disconnected.
"H"
Inner track limit switch is short-circuited.
Are there outputs at pins ㉕ and ㉖ of IC703?
NG
OK
Optical pickup failure
Is there an output at pin ㉘ of IC702? (FOD)
NG
OK
IC702 failure
IC703 failure
Measure voltage across R701.
Below 0.2V
Above 0.2V
Optical pickup failure
Measure voltage between Ⓑ and Ⓔ of Q701.
Above 0.6V
Below 0.6V
Q701 or optical pickup is defective.
IC701 failure
Are there outputs at pins ⑮ and ⑯ of IC703?
NG
OK
Traverse deck failure
Is there an output at pin ㉑ of IC702? (TRV)
NG
OK
IC702 failure
IC703 failure
Changes from "H" to "L"
Is there an output at pin ㉔ of IC702? (ECM)
Remain at 2.5V (High impedance)
Changes from 2.5V to "L" (High impedance)
IC703 failure
IC702 failure

Type Illustration of ICs, Transistors and Diodes

BA4558FHTT1 	AN8837SBE1 	AN8780NSBE2 	TA7291S 	LM2940T5M 	LC66356C4K19 
MN662741RPA 	TOTX178 	2SB709STX DTC114YKA146 	2SD2137PQTA 		2SC1740SRSTA 2SA933SSTA DTC114YSTP DTC143ESTP DTA143XSTP
RL1N4003N02 	MTZJ5R1BTA MTZJ8R2BTA 	1SS254TA 	SPR-305MDTF 		

Wiring Connection Diagram



Schematic Diagram (See parts list on pages 32, 33.)

	Page
A SERVO CIRCUIT	20, 21
B LOADING MOTOR CIRCUIT	22
C MAIN CIRCUIT	22, 23
D OPERATION CIRCUIT	22
E POWER SUPPLY CIRCUIT	23

- **This schematic diagram may be modified at any time with the development of new technology.**

Notes:

- S701 : Rest detect switch in "OFF" position
- S790 : Tray open detect switch in "OFF" position
- S791 : Tray close detect switch in "OFF" position
- S801 : Tray open/close detect switch (⏏ OPEN/CLOSE) in "OPEN" position
- S802 : Pause switch (⏸)
- S803 : F. Skip/Search switch (▶▶ / ▶▶|)
- S804 : Play switch (▶)
- S805 : Stop switch (■)
- S806 : R. Skip/Search switch (|◀◀ / ◀◀)
- S807 : Random play switch (RANDOM)
- S808 : AI edit switch (AI EDIT)
- S809 : Repeat switch (REPEAT)

- Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.
  No mark: CD STOP
  ( ): CD PLAY [1 kHz, L + R, 0 dB]

- Important safety notice:
  Components identified by ⚠ mark have special characteristics important for safety.
  Furthemore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.
  When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

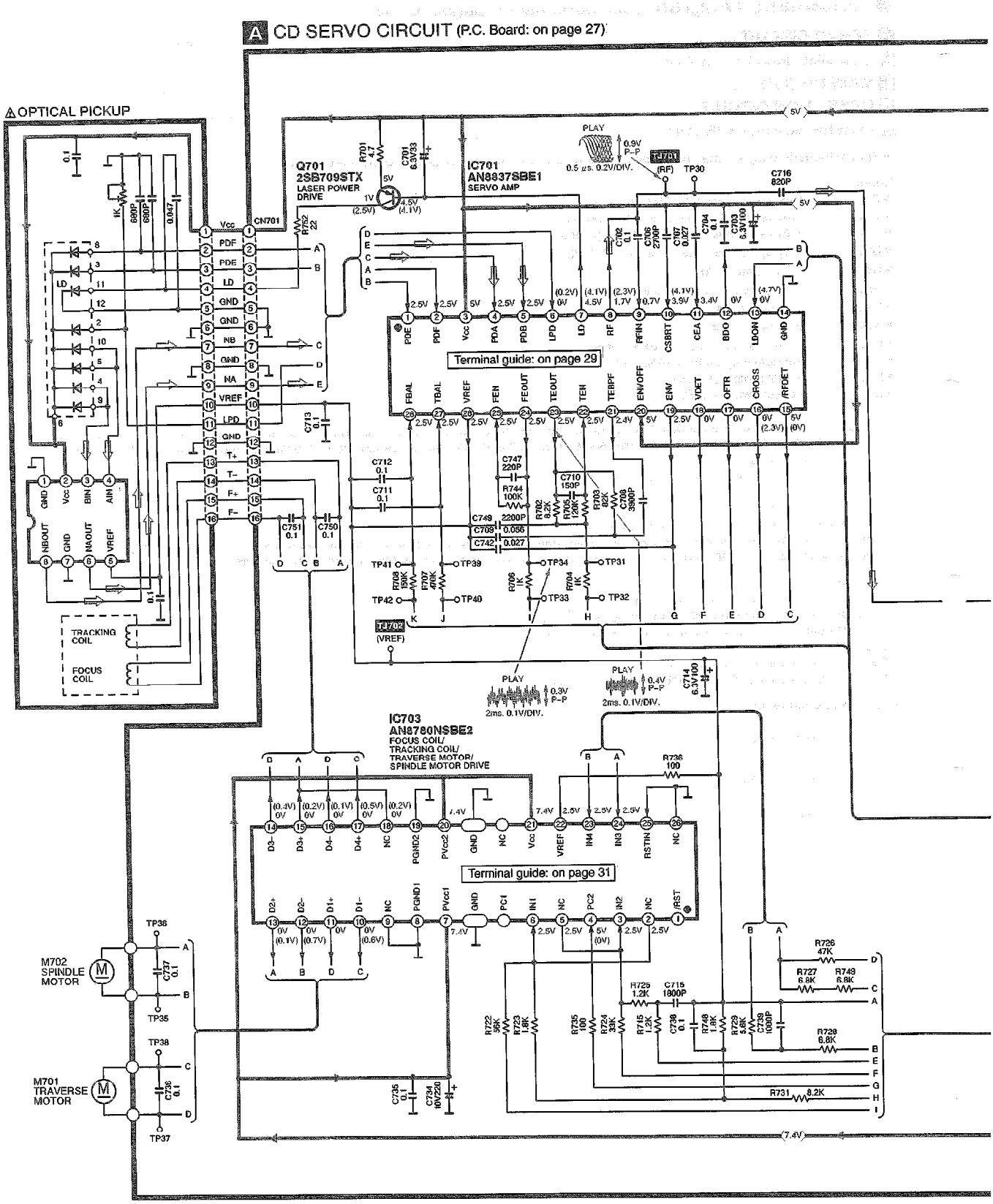
- **Caution!**
  IC and LSI are sensitive to static electricity.
  Secondary trouble can be prevented by taking care during repair.
  Cover the parts boxes made of plastics with aluminum foil.
  Ground the soldering iron.
  Put a conductive mat on the work table.
  Do not touch the legs of IC or LSI with the fingers directly.

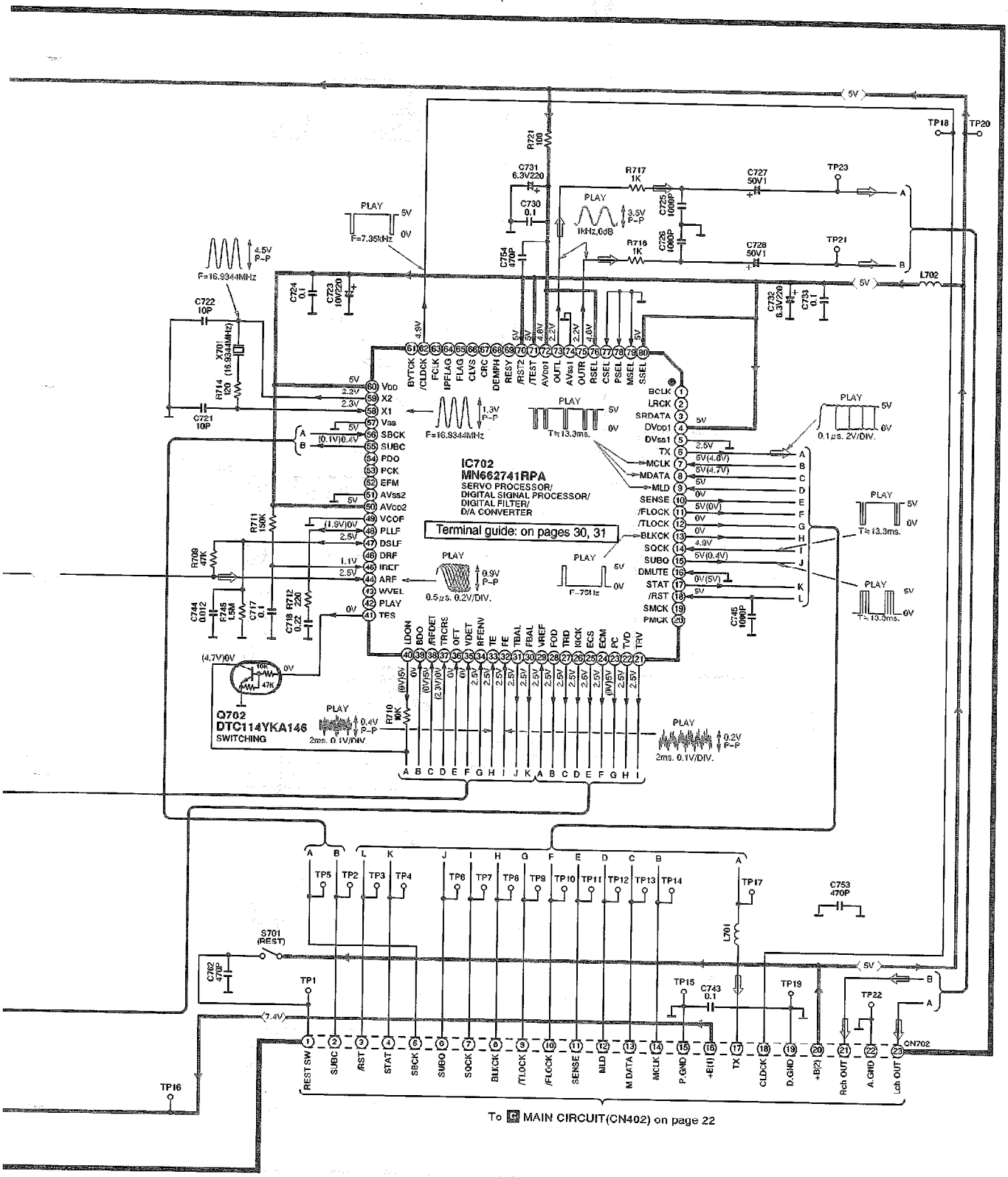
- **Voltage and signal line**

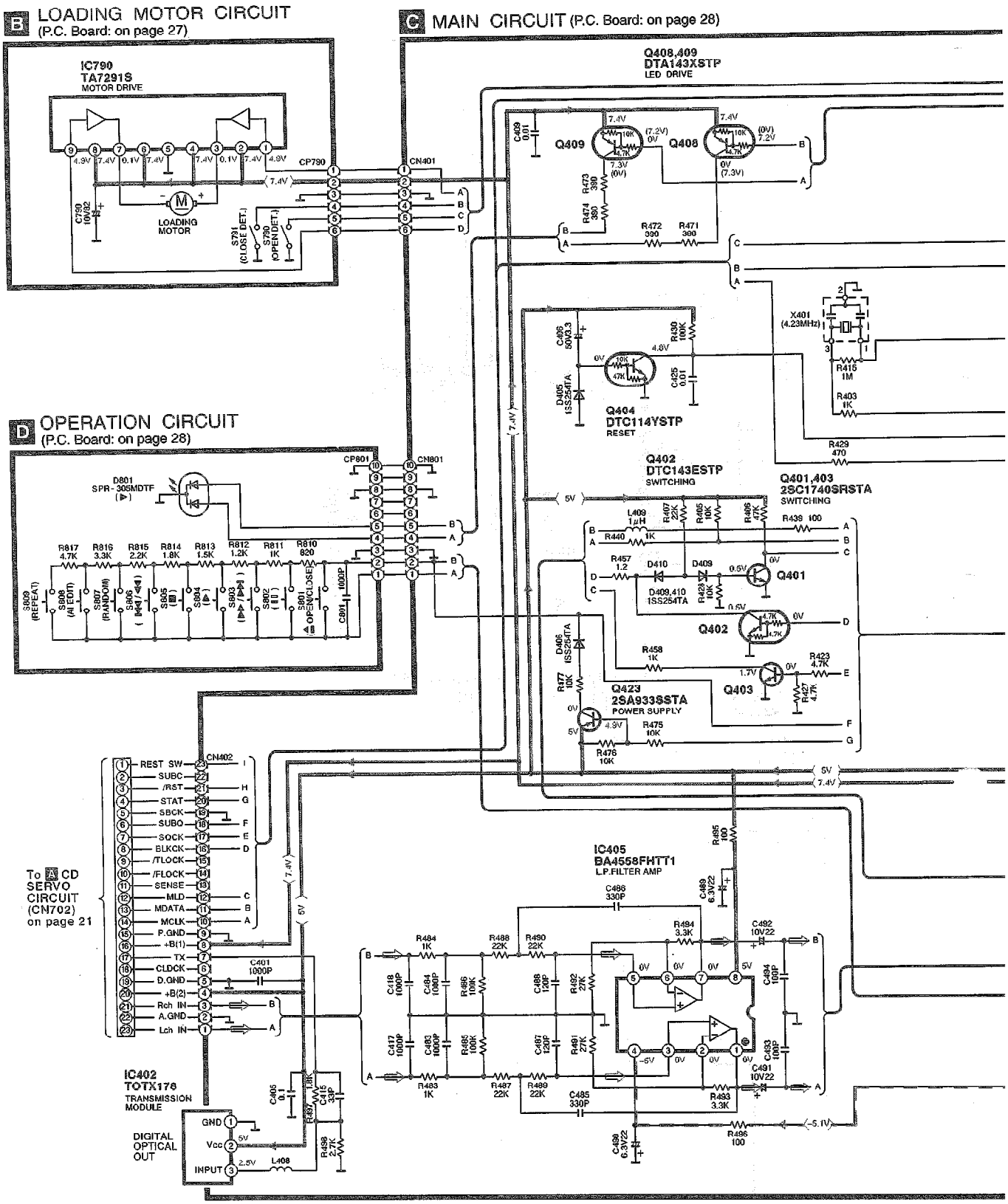
: Positive voltage line

: Negative voltage line

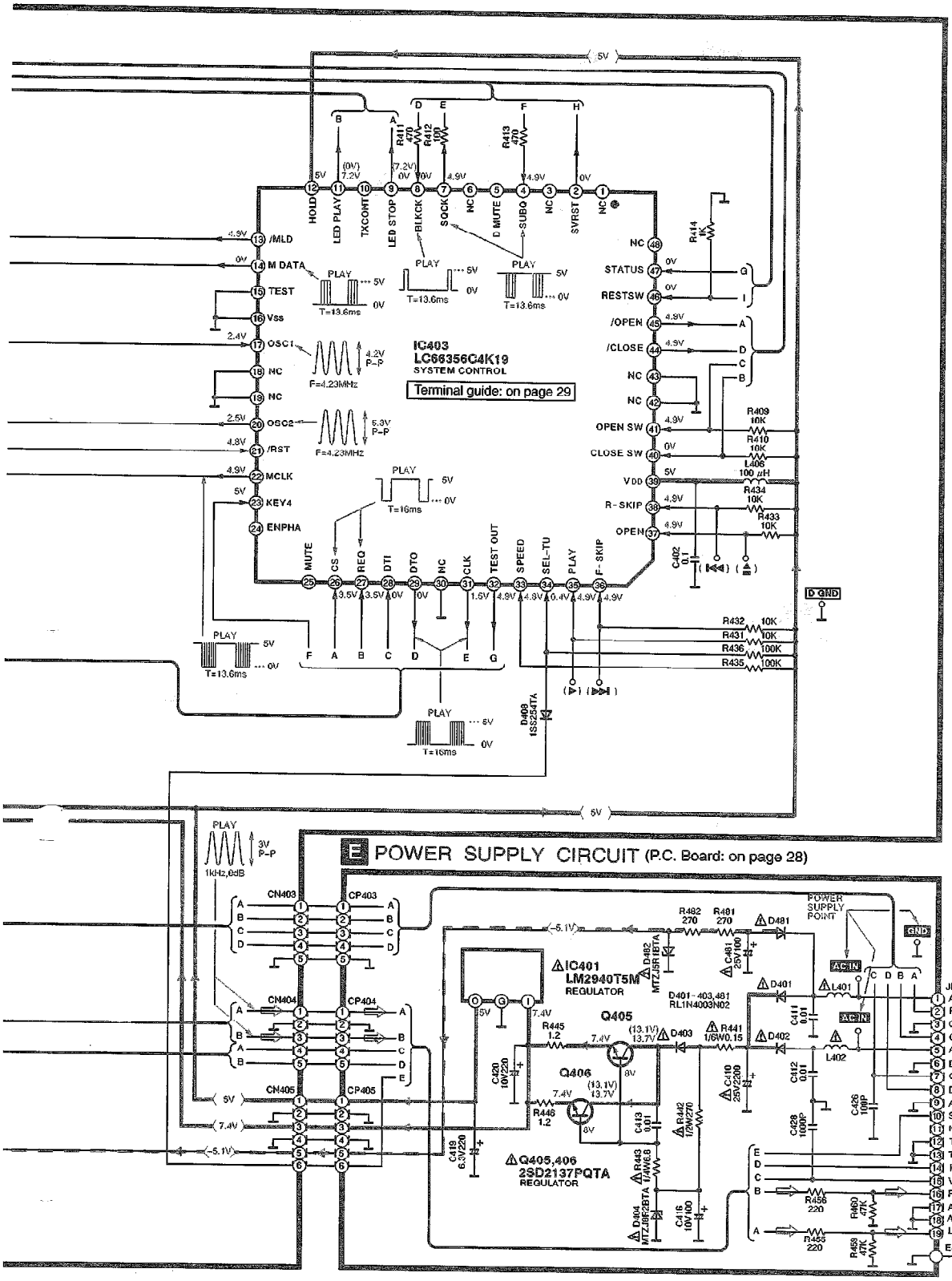
: CD signal line


A CD SERVO CIRCUIT (P.C. Board: on page 27)
OPTICAL PICKUP
Q701
2SB709STX
LASER POWER DRIVE
IC701
AN8837SBE1
SERVO AMP
IC703
AN8780NSBE2
FOCUS COIL/
TRACKING COIL/
TRAVERSE MOTOR/
SPINDLE MOTOR DRIVE
CN701
Terminal guide: on page 29
Terminal guide: on page 31
TRACKING COIL
FOCUS COIL
M702
SPINDLE MOTOR
M701
TRAVERSE MOTOR
PLAY
(RF)
(VREF)
TP30
TP31
TP32
TP33
TP34
TP35
TP36
TP37
TP38
TP39
TP40
TP41
TP42
5V
7.4V

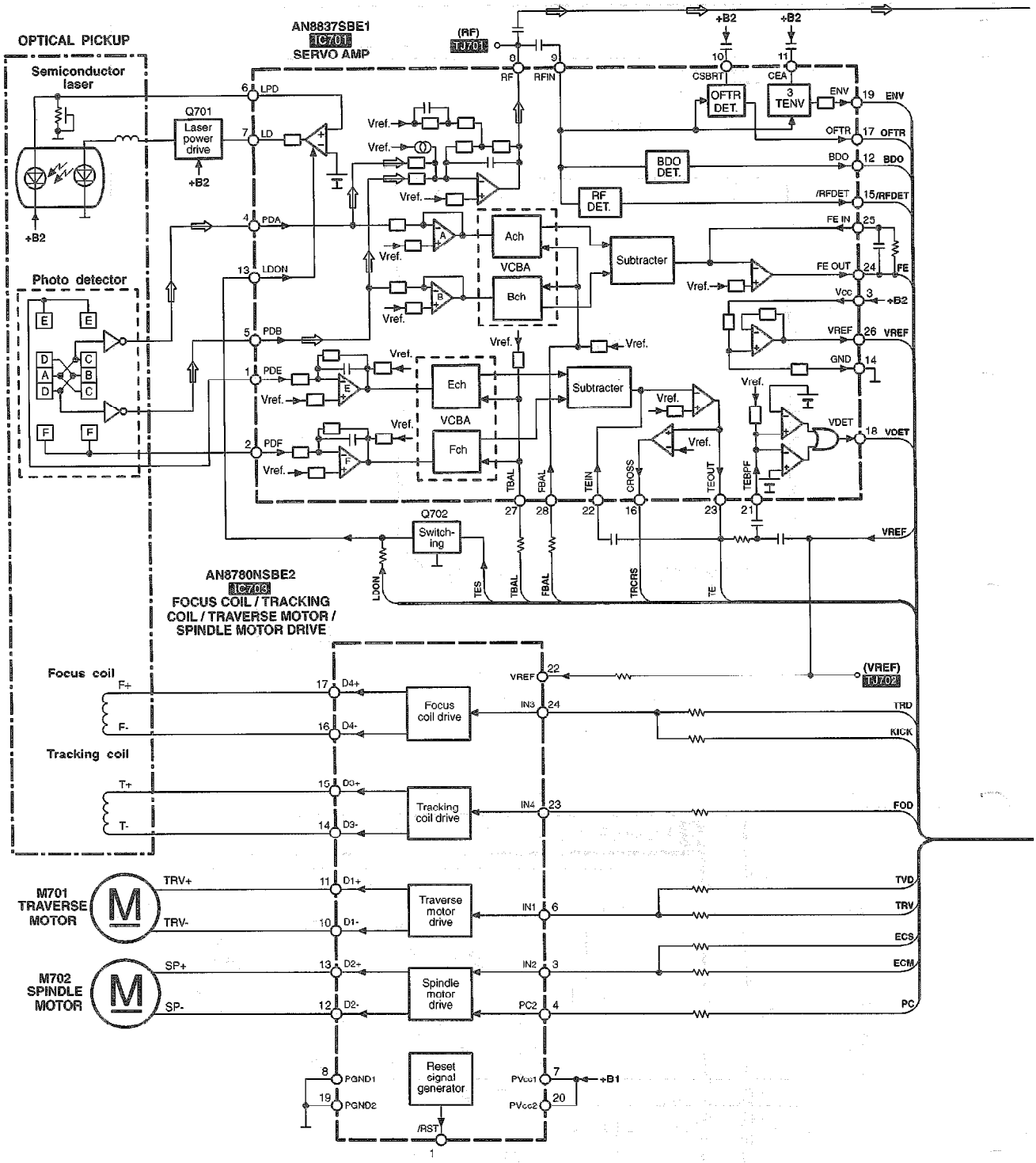

IC702
MN662741RPA
SERVO PROCESSOR/
DIGITAL SIGNAL PROCESSOR/
DIGITAL FILTER/
D/A CONVERTER
Terminal guide: on pages 30, 31
Q702
DTC114YKA146
SWITCHING
To C MAIN CIRCUIT(CN402) on page 22

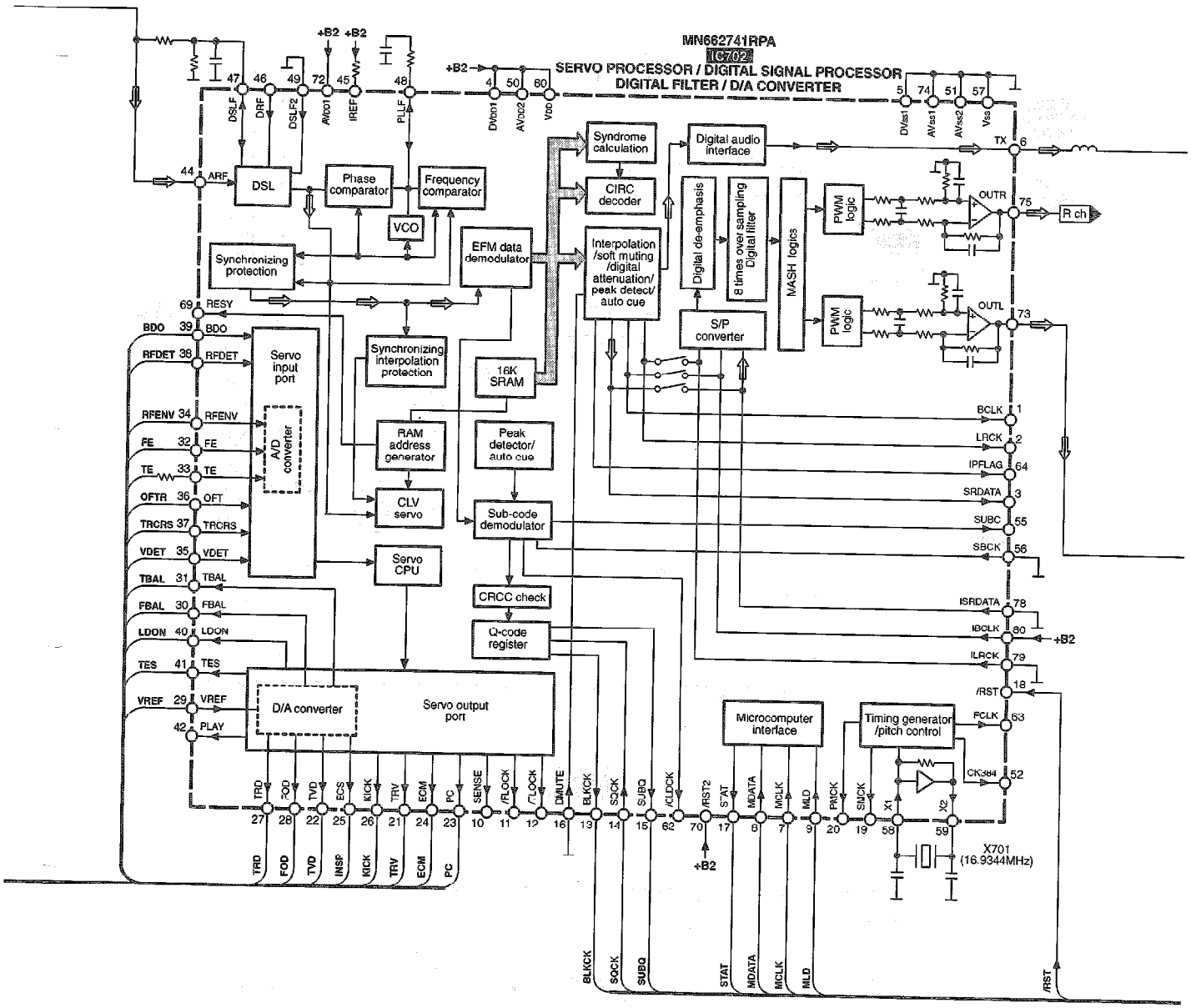

B LOADING MOTOR CIRCUIT
(P.C. Board: on page 27)
IC790
TA7291S
MOTOR DRIVE
LOADING MOTOR
S791 (CLOSE DET.)
S792 (OPEN DET.)
CP790
CN401
C MAIN CIRCUIT (P.C. Board: on page 28)
Q408,409
DTA143XSTP
LED DRIVE
Q409
Q408
Q404
DTC114YSTP
RESET
X401 (4.23MHz)
Q402
DTC143ESTP
SWITCHING
Q401,403
2SC1740SRSTA
SWITCHING
Q401
Q402
Q403
Q423
2SA933SSTA
POWER SUPPLY
D OPERATION CIRCUIT
(P.C. Board: on page 28)
D801
SPR-305MDTF
CP801
CN801
S809 (REPEAT)
S808 (AI EDIT)
S807 (RANDOM)
S806 (M+/M-)
S805 (■)
S804 (◀)
S803 (▶/▶▶|)
S802 (II)
S801 (OPEN/CLOSE)
To A CD SERVO CIRCUIT (CN702) on page 21
CN402
REST SW
SUBC
/RST
STAT
SBCK
SUBQ
SQCK
BLKCK
/TLOCK
/FLOCK
SENSE
MLD
MDATA
MCLK
P.GND
+B(1)
TX
CLDCK
D.GND
+B(2)
Rch IN
A.GND
Lch IN
IC405
BA4558FHTT1
L.P.FILTER AMP
IC402
TOTX176
TRANSMISSION MODULE
DIGITAL OPTICAL OUT
GND
Vcc
INPUT
5V
2.5V

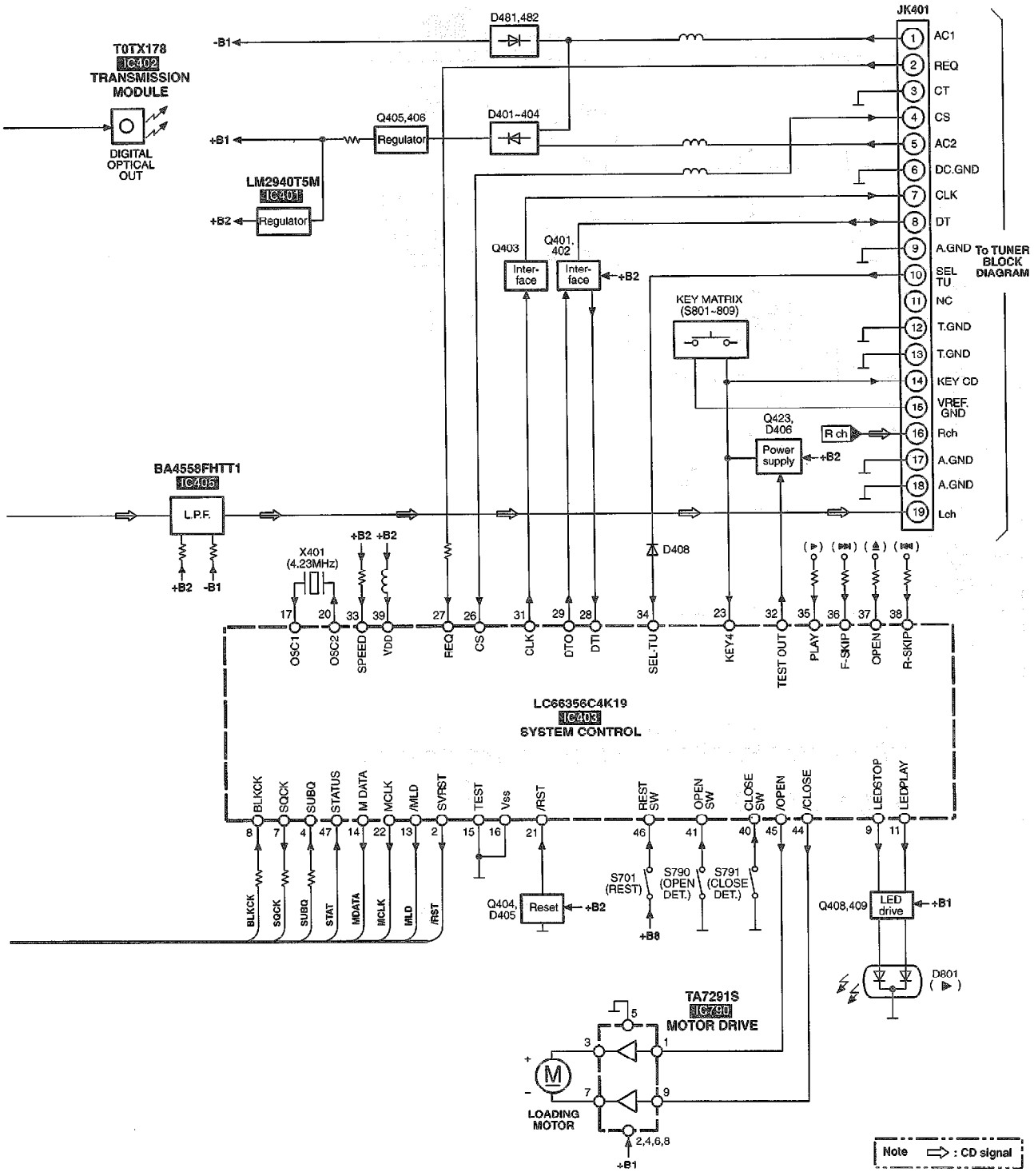
Note: ● ⟹ : CD signal



Block Diagram



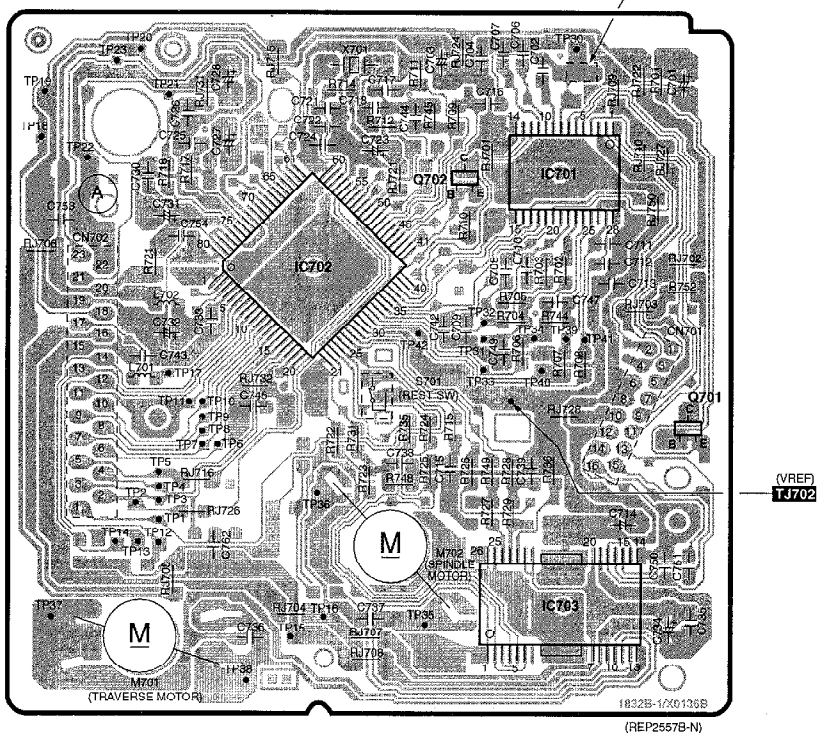

MN662741RPA
IC702
SERVO PROCESSOR / DIGITAL SIGNAL PROCESSOR
DIGITAL FILTER / D/A CONVERTER
+B2
DSL
Phase comparator
Frequency comparator
VCO
Synchronizing protection
EFM data demodulator
Syndrome calculation
CIRC decoder
Interpolation /soft muting /digital attenuation/ peak detect/ auto cue
Digital audio interface
Digital de-emphasis
8 times over sampling Digital filter
NASH logics
S/P converter
PWM logic
Servo input port
A/D converter
Synchronizing interpolation protection
16K SRAM
RAM address generator
Peak detector/ auto cue
CLV servo
Sub-code demodulator
Servo CPU
CRCC check
Q-code register
D/A converter
Servo output port
Microcomputer interface
Timing generator /pitch control
X701 (16.9344MHz)
R ch
BCLK
LRCK
IPFLAG
SRDATA
SUBC
SBCK
ISRDATA
IBCLK
ILRCK
/RST
FCLK
CK384
MDATA
MCLK
MLD
BLKCK
SOCK
SUBQ
STAT
/RST


T0TX178
IC402
TRANSMISSION MODULE
DIGITAL OPTICAL OUT
LM2940T5M
IC401
Regulator
Q405,406
Regulator
D481,482
D401~404
-B1
+B1
+B2
JK401
AC1
REQ
CT
CS
AC2
DC.GND
CLK
DT
A.GND
SEL TU
NC
T.GND
T.GND
KEY CD
VREF. GND
Rch
A.GND
A.GND
Lch
To TUNER BLOCK DIAGRAM
Q403
Inter-face
Q401, 402
Inter-face
KEY MATRIX (S801~809)
Q423, D406
Power supply
R ch
BA4558FHTT1
IC405
L.P.F.
X401 (4.23MHz)
D408
OSC1
OSC2
SPEED
VDD
REQ
CS
CLK
DTO
DTI
SEL-TU
KEY4
TEST OUT
PLAY
F-SKIP
OPEN
R-SKIP
LC66356C4K19
IC403
SYSTEM CONTROL
BLKCK
SOCK
SUBQ
STATUS
M DATA
MCLK
/MLD
SVRST
TEST
Vss
/RST
REST SW
OPEN SW
CLOSE SW
/OPEN
/CLOSE
LEDSTOP
LEDPLAY
S701 (REST)
S790 (OPEN DET.)
S791 (CLOSE DET.)
Q404, D405
Reset
Q408,409
LED drive
D801
TA7291S
IC790
MOTOR DRIVE
LOADING MOTOR
Note : CD signal

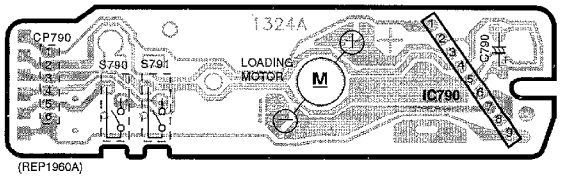
■ Printed Circuit Board Diagram

(This printed circuit board diagram may be modified at any time with the development of new technology.)

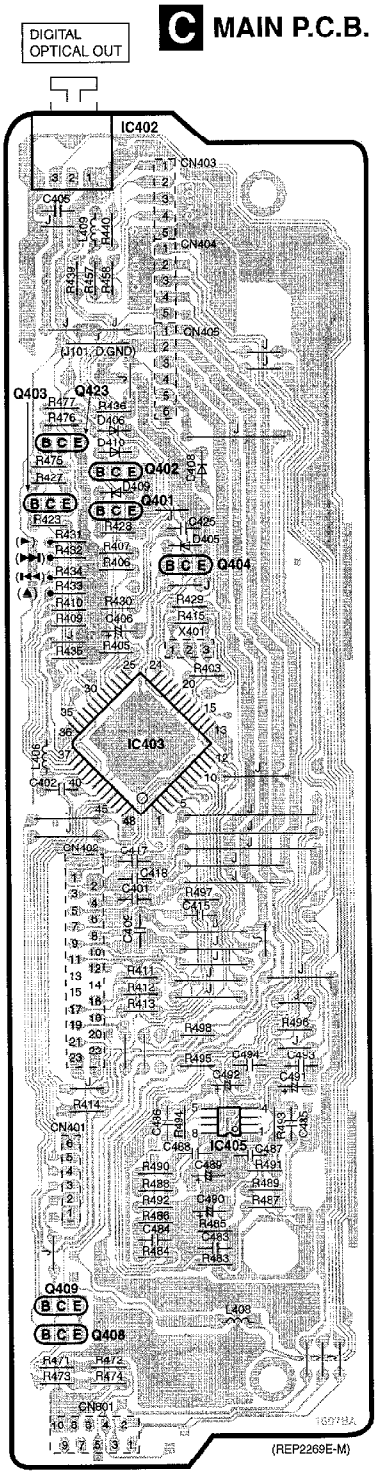
A CD SERVO P.C.B.



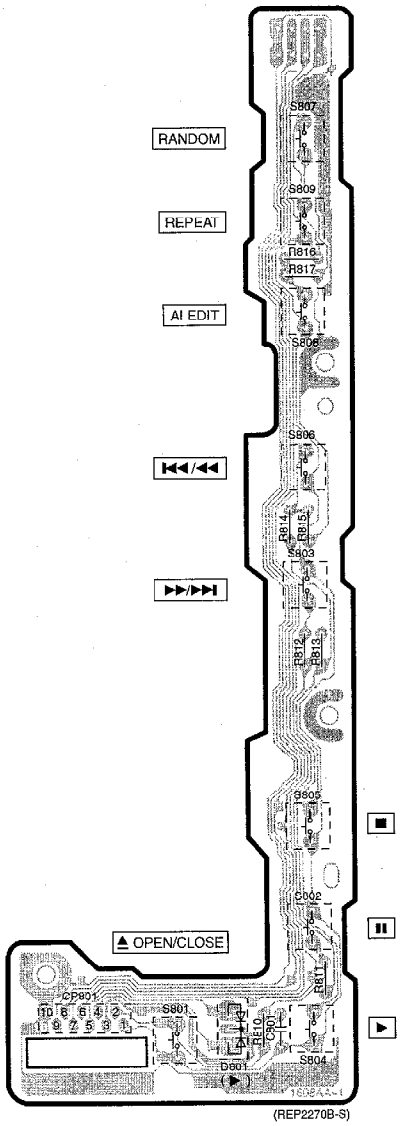
B LOADING MOTOR P.C.B.



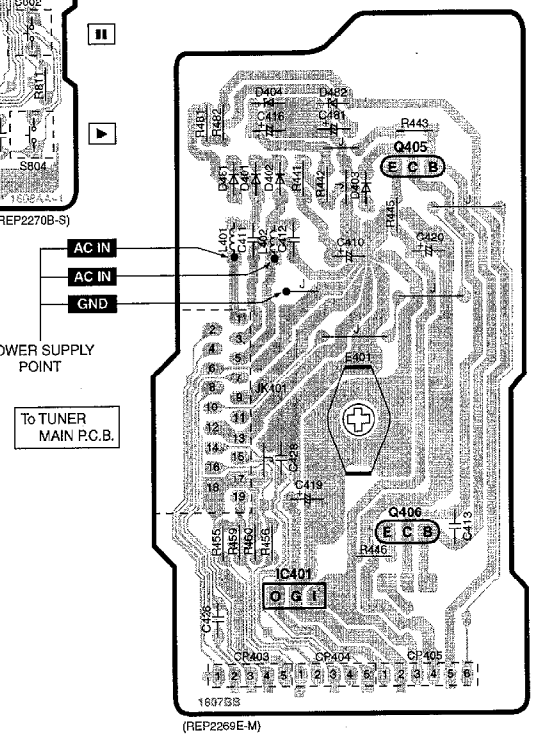
C MAIN P.C.B.



D OPERATION P.C.B.



E POWER SUPPLY P.C.B.



■ Terminal Function of IC's

● IC403 (LC66356C4K19): SYSTEM CONTROL

Pin No.	Terminal Name	I/O	Function
1	NC	—	Not used, open
2	SVRST	O	Reset signal output terminal
3	NC	—	Not used, open
4	SUBQ	I	Sub-code Q data input terminal
5	DMUTE	—	Not used, open
6	NC	—	Not used, open
7	SQCK	O	Sub-code Q resistor clock output terminal
8	BLKCK	I	Sub-code block clock input terminal (f=75 Hz)
9	LED STOP	O	LED drive signal output terminal
10	TX CONT	—	Not used, open
11	LED PLAY	O	LED drive signal output terminal
12	HOLD	I	Not used, connected power supply
13	/MLD	O	Command load signal output terminal
14	MDATA	O	Command data signal output terminal
15	TEST	—	Test terminal
16	VSS	—	GND terminal
17	OSC1	I	Crystal OSC terminal (f=4.2336 MHz)
18, 19	NC	—	Not used, connected to GND
20	OSC2	O	Crystal OSC terminal (f=4.2336 MHz)
21	/RST	I	Rest signal input terminal
22	MCLK	O	Command clock signal output terminal
23	KEY4	I	Key switch det. terminal
24	EMPHA	—	Not used, open

Pin No.	Terminal Name	I/O	Function
25	MUTE	—	Not used, open
26	CS	I	Communication chip select signal input terminal
27	REQ	I	Communication request signal input terminal
28	DTI	I	Communication data signal input/output terminal
29	DTO	O	
30	NC	—	Not used, connected to GND
31	CLK	O	Communication clock signal output terminal
32	TEST OUT	O	Not used, connected to power supply
33	SPEED	I	Not used, connected to resistor
34	SEL-TU	I	Communication data signal input terminal
35	PLAY	I	Not used, connected to resistor
36	F-SKIP	I	Not used, connected to resistor
37	OPEN	I	Not used, connected to resistor
38	R-SKIP	I	Not used, connected to resistor
39	VDD	I	Power supply input terminal
40	CLOSE SW	I	Disc tray "CLOSE" det. input terminal
41	OPEN SW	I	Disc tray "OPEN" det. input terminal
42, 43	NC	—	Not used, connected to GND
44	/CLOSE	O	Loading motor "CLOSE" signal output terminal
45	/OPEN	O	Loading motor "OPEN" signal output terminal
46	RESTSW	I	Rest position det. input terminal
47	STATUS	I	Status signal input terminal
48	NC	—	Not used, open

● IC701 (AN8837SBE1): SERVO AMP

No.	Mark	I/O Division	Function
1	PDE	I	Tracking signal input terminal (1)
2	PDF	I	Tracking signal input terminal (2)
3	Vcc	I	Power supply terminal
4	PDA	I	Focus signal input terminal (1)
5	PDB	I	Focus signal input terminal (2)
6	LPD	I	APC amp input terminal
7	LD	O	APC amp output terminal
8	RF	O	RF summing output terminal
9	RF IN	I	RF signal input terminal
10	CSBRT	I	Capacitor connection terminal for OFTR
11	CEA	I	Capacitor connection terminal for H.P.F. amp
12	BDO	O	Dropout signal output terminal ("H": Dropout)
13	LDON	I	APC control input terminal
14	GND	—	GND terminal

No.	Mark	I/O Division	Function
15	/RFDET	O	RF det. signal output terminal ("L": Det.)
16	CROSS	O	Track cross signal output terminal
17	OFTR	O	Off track signal output terminal ("H": Off track)
18	VDET	O	Vibration detection signal output terminal
19	ENV	O	RF envelope signal output terminal
20	ENV OFF	I	ENV control input terminal
21	TEBPF	O	Not used, connected to capacitor
22	TEN	I	Tracking error amp input terminal
23	TE OUT	O	Tracking error amp output terminal
24	FE OUT	O	Focus error amp output terminal
25	FEN	I	Focus error amp input terminal
26	VREF	O	Reference voltage output terminal
27	TBAL	I	Tracking balance signal input terminal
28	FBAL	I	Focus balance signal input terminal

● IC702 (MN662741RPA): SERVO PROCESSOR, DIGTAL SIGNAL PROCESSOR, DIGITAL FILTER, D/A CONVERTER

Pin No.	Terminal Name	I/O	Function
1	BCLK	O	Bit clock output for serial data (Not used, open)
2	LRCK	O	L/R clock signal output (Not used, open)
3	SRDATA	O	Serial data output (Not used, open)
4	DVDD1	—	Power supply input (for digital circuit)
5	DVss1	—	GND (for digital circuit)
6	TX	O	Digital audio interface signal output
7	MCLK	I	Microprocessor command clock signal input (Latches data at first transition)
8	MDATA	I	Microprocessor command data signal input
9	MLD	I	Microprocessor command load signal input
10	SENSE	O	Sense signal output (OFT, FESL, MAGEND, NAJEND, POSAD, SFG)
11	/FLOCK	O	Focus servo feeding signal output ("L": Feed)
12	/TLOCK	O	Tracking servo feeding signal output ("L": Feed)
13	BLKCK	O	Sub-code block clock signal output (fBLKCK=75 Hz during normal playback)
14	SQCK	I	External clock signal input for sub-code Q resister
15	SUBQ	O	Sub-code Q code output
16	DMUTE	I	Muting input ("H": Mute) (Not used, connected to GND)
17	STAT	O	Status signal output (CRC, CUE, CLVS, TTSTVP, FCLV, SQCK)
18	/RST	I	Reset signal input
19	SMCK	—	1/2-divided clock signal of crystal oscillating at MSEL="H" (fSMCK=8.4672 MHz) 1/4-divided clock signal of crystal oscillating at MSEL="L" (fSMCK=4.2336 MHz) (Not used, open)
20	PMCK	—	1/192-divided clock signal of crystal oscillating (fPMCK=88.2 kHz) (Not used, open)
21	TRV	O	Traverse forced feed output
22	TVD	O	Traverse drive output
23	PC	O	Spindle motor ON signal output ("L": ON)
24	ECM	O	Spindle motor drive signal output (forced mode output)
25	ECS	O	Spindle motor drive signal output (servo error signal output)
26	KICK	O	Kick pulse output
27	TRD	O	Tracking drive output
28	FOD	O	Focus drive output
29	VREF	I	D/A (drive) output (TVD, ECS, TRD, FOD, FBAL, TBAL) reference voltage input
30	FBAL	O	Focus balance adjustment output
31	TBAL	O	Tracking balance adjustment output
32	FE	I	Focus error signal input (analog input)
33	TE	I	Tracking error signal input (analog input)
34	RFENV	I	RF envelope signal input
35	VDET	I	Vibration detection signal input ("H": detection)

Pin No.	Terminal Name	I/O	Function
36	OFT	I	Off-track signal input ("H": off track)
37	TRCRS	I	Track cross signal input
38	/RFDET	I	RF detection signal input ("L": detection)
39	BDO	I	Dropout signal input ("H": Dropout)
40	LDON	O	Laser on signal output ("H": ON)
41	TES	O	Tracking error shunt signal output ("H": shunt)
42	PLAY	O	Play signal out ("H": PLAY) (Not used, open)
43	WVEL	O	Double speed status signal output ("H": Double speed) (Not used, open)
44	ARF	I	RF signal input
45	IREF	I	Reference current input
46	DRF	—	DSL bias (Not used, open)
47	DSLF	I/O	DSL loop filter
48	PLLF	I/O	PLL loop filter
49	VCOF	I/O	VCO loop filter
50	AVDD2	—	Power supply input (for analog circuit)
51	AVss2	—	GND (for analog circuit)
52	EFM	—	EFM signal output (Not used, open)
53	PCK	—	PLL extraction clock output (fPCK=4.321 MHz during normal playback) (Not used, open)
54	PDO	—	Phase comparison signal of EFM and PCK signals (Not used, open)
55	SUBC	O	Sub-code serial data output
56	SBCK	I	Clock input for sub-code serial data
57	Vss	—	GND
58	X1	I	Crystal oscillating circuit input (f=16.9344 MHz)
59	X2	O	Crystal oscillating circuit output (f=16.9344 MHz)
60	VDD	—	Power supply input (for oscillating circuit)
61	BYTCK	—	Byte clock output (Not used, open)
62	/CLDCK	O	Sub-code frame clock signal output (fCLDCK=7.35 kHz during normal playback)
63	FCLK	—	Crystal frame clock signal output (fFCLK=7.35 kHz, double=14.7 kHz) (Not used, open)
64	IPFLAG	O	Interpolation flag output ("H": Interpolation) (Not used, open)
65	FLAG	O	Flag output (Not used, open)
66	CLVS	O	Spindle servo phase synchronizing signal output ("H": CLV, "L": rough servo) (Not used, open)
67	CRC	O	Sub-code CRC checked output ("H": OK, "L": NG) (Not used, open)
68	DEMPH	O	De-emphasis ON signal output ("H": ON) (Not used, open)
69	RESY	—	Frame re-synchronizing signal output (Not used, open)
70	/RST2	I	Reset input through MASH circuit ("L": Reset)
71	/TEST	I	Test input

● IC702 CONTINUED

Pin No.	Terminal Name	I/O	Function
72	AVDD1	—	Power supply input (for analog circuit)
73	OUTL	O	Left channel audio signal output
74	AVss1	—	GND
75	OUTR	O	Right channel audio signal output
76	RSEL	I	RF signal polarity assignment input (at "H" level: RSEL="H") (at "L" level: RSEL="L")
77	CSEL	I	Crystal oscillating frequency designation input ("L": 16.9344 MHz, "H": 33.8688 MHz) (Not used, connected to GND)
78	PSEL	I	Test terminal (Normal: "L") (Not used, connected to GND)
79	MSEL	I	"SCMK" terminal frequency select ("L": SCMK=4.2336 MHz) (Not used, connected GND)
80	SSEL	I	"SCMK" terminal mode select ("H": Q code buffer) (Not used, connected to power supply)

● IC703 (AN8780NSBE2):
FOCUS/TRACKING COIL DRIVE
TRAVERSE/SPINDLE MOTOR DRIVE

Pin No.	Terminal Name	I/O	Function
1	/RST	—	Not used, open
2	NC	—	——
3	IN2	I	Motor driver (2) input
4	PC2	I	Turn table motor drive signal ("L": ON)
5	NC	—	——
6	IN1	I	Motor driver (1) input
7	PVcc1	I	Driver power supply terminal (1)
8	PGND1	—	Driver GND terminal (1)
9	NC	—	——
10	D1–	O	Motor driver (1) output terminal (–)
11	D1+	O	Motor driver (1) output terminal (+)
12	D2–	O	Motor driver (2) output terminal (–)
13	D2+	O	Motor driver (2) output terminal (+)
14	D3–	O	Motor driver (3) output terminal (–)
15	D3+	O	Motor driver (3) output terminal (+)
16	D4–	O	Motor driver (4) output terminal (–)
17	D4+	O	Motor driver (4) output terminal (+)
18	NC	—	——
19	PGND2P	—	Driver GND terminal (2)
20	PVcc2	I	Driver power supply (2)
21	VCC	I	Power supply terminal
22	VREF	I	Reference voltage input terminal
23	IN4	I	Motor driver (4) input
24	IN3	I	Motor driver (3) input
25	RSTIN	I	Reset terminal (Not used, connected to GND)
26	NC	—	——

Replacement Parts List

Notes: * Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.
When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

* The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
Parts without these indications can be used for all areas.
* Warning: This product uses a laser diode. Refer to caution statements on page 2.
* Capacity values are in microfarads (uF) unless specified otherwise,
P=Pico-farads (pF) F=Farads (F)
* Resistance values are in ohms, unless specified otherwise, 1K=1,000 (OHM), 1M=1,000k (OHM)

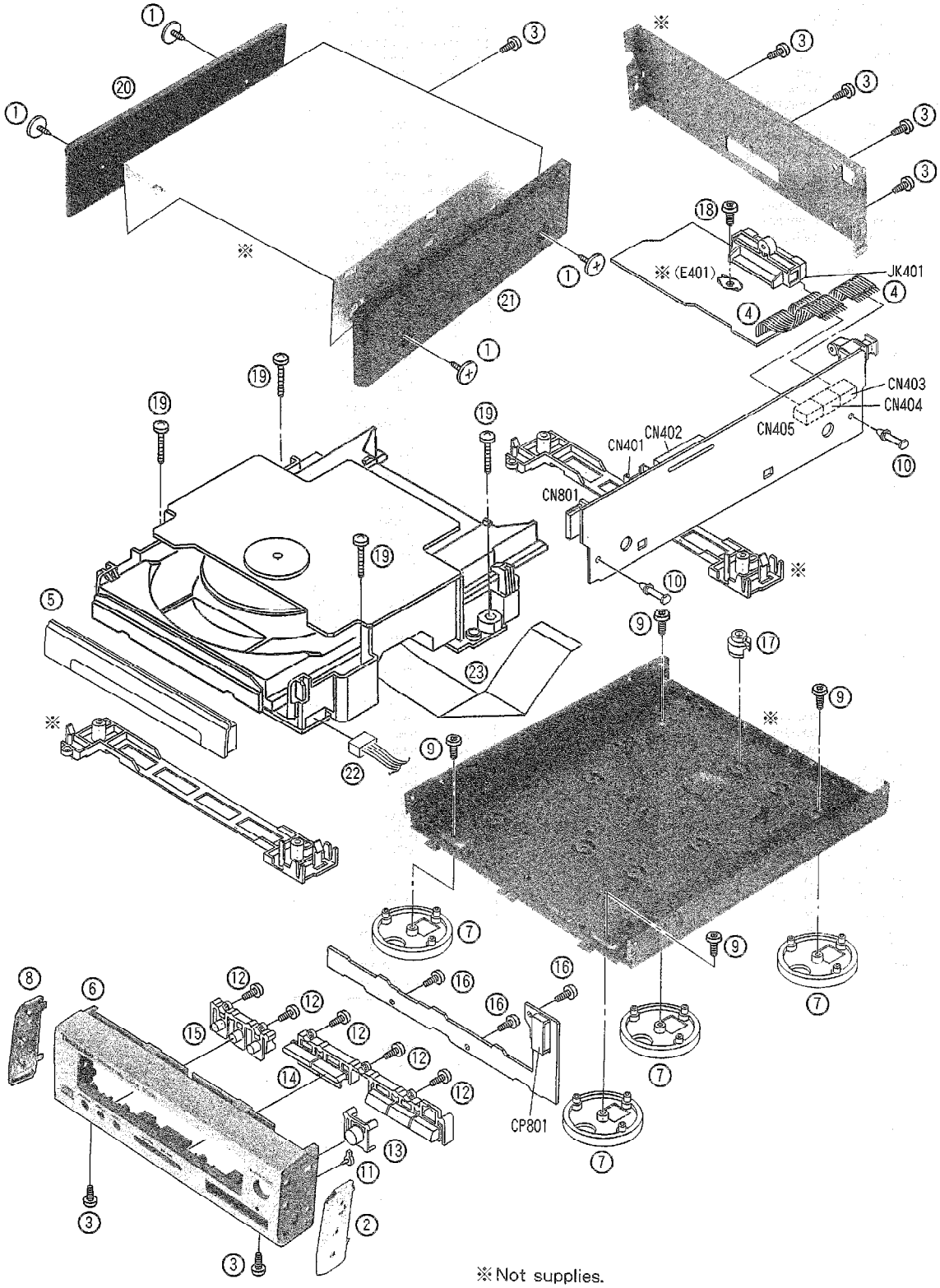
Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
1	RHD30073-K	SCREW	4	
2	RGK0820-N3	SIDE ORNAMENT(R)	1	
3	XTBS3+8JFZ1	SCREW	7	
4	REZ0888	WIRE ASS'Y	1	
5	RYQ0203A-S	TRAY ORNAMENT	1	
6	RFKGLHD51E-N	FRONT PANEL ASS'Y	1	
7	RKA0076-N	FOOT	4	
8	RGK0819-N3	SIDE ORNAMENT(L)	1	
9	XTB3+6G	SCREW	4	
10	RMR0502	SPACER	2	
11	RGL0335-1Q	L.E.D. INDEX	1	
12	XQN26+AJ6FZ	SCREW	5	
13	RFKNLHD7NB	BUTTON, OPEN/CLOSE	1	
14	RFKNLHD7NC	BUTTON, PLAY/STOP	1	
15	RFKNLHD7ND	BUTTON, RDM/REP/REC	1	
16	XTBS26+8J	SCREW	3	
17	SHE170-2	P.C.B. SUPPORT	1	
18	XTB3+12JFZ	SCREW	1	
19	XTB3+18JFZ	SCREW	4	
20	RGK0817-1M	SIDE PANEL(L)	1	
21	RGK0818-1M	SIDE PANEL(R)	1	
22	REX0844	WIRE ASS'Y	1	
23	REZ0887	FLAT CABLE(23P)	1	
301	RFKJXDT07-K	LOADING CHASSIS ASS'Y	1	
301-1	RDG0142	GEAR	1	
301-2	RDG0193	GEAR	1	
301-3	RDP0065	PULLEY	1	
302	REM0019	LOADING MOTOR ASS'Y	1	
303	RMK0255	BELT COVER	1	
304	RGQ0144-K	DISC TRAY	1	
305	RAE0152Z	TRAVERSE DECK	1	
305-1	SHGD113-1	RUBBER	3	
305-2	SNSD38	SCREW	2	
306	RMS0350-1	PIN(A)	1	
307	RMS0627	PIN(B)	1	
308	RME0109	SPRING(A)	2	
309	RME0142	SPRING(B)	1	
310	RMR0698-K	TRAVERSE CHASSIS	1	
311	XTVZ+6G	SCREW	2	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
312	RME0063	SPRING	1	
313	RMM0079-1	SLIDE PLATE	1	
314	RML0178-1	LEVER	1	
315	RFKNLPG440-K	GEAR ASS'Y	1	
316	RHD20009-1	SCREW	1	
317	RME0087	SPRING	1	
318	RML0349	LEVER	1	
319	RMM0059-1	SLIDE PLATE	1	
320	RMR0334	HOLDER	1	
321	RHM245ZA	MAGNET	1	
322	RXQ0380	MAGNET HOLDER	1	
323	XTN26+6G	SCREW	3	
324	RMA0793	CLAMPER	1	
325	XYN2+F6FZ	SCREW	2	
326	RMG0158	BELT	1	
327	XTN2+6G	SCREW	1	
C401	ECBT1H102KB5	50V 1000P	1	
C402	ECBT1H104ZF5	50V 0.1U	1	
C405	ECBT1H104ZF5	50V 0.1U	1	
C406	RCE1HKS3R3BV	50V 3.3U	1	
C409	ECBT1E103ZF5	25V 0.01U	1	
⚠ C410	ECA1EM222B	25V 2200U	1	
C411-13	ECBT1E103ZF5	25V 0.01U	3	
C415	ECBT1H330J5	50V 33P	1	
C416	RCE1AKA101BG	10V 100U	1	
C417,18	ECBT1H102KB5	50V 1000P	2	
C419	ECEA0JKA221B	6.3V 220U	1	
C420	ECEA1AKA221B	10V 220U	1	
C425	ECBT1E103ZF5	25V 0.01U	1	
C426	ECBT1H101KB5	50V 100P	1	
C428	ECBT1H102KB5	50V 1000P	1	
⚠ C481	ECA1EM101B	25V 100U	1	
C483,84	ECBT1H102KB5	50V 1000P	2	
C485,86	ECBT1H331KB5	50V 330P	2	
C487,88	ECBT1H121KB5	50V 120P	2	
C489,90	ECEA0JKS220B	6.3V 22U	2	
C491,92	ECEA1AKA220B	10V 22U	2	
C493,94	ECBT1H101KB5	50V 100P	2	
C701	ECEA0JKA330I	6.3V 33U	1	
C702	ECUZNE104MBN	25V 0.1U	1	
C703	ECEA0JKA101I	6.3V 100U	1	
C704	ECUZNE104MBN	25V 0.1U	1	
C706	ECUE1H272KBN	50V 2700P	1	
C707	ECUV1E273KBN	25V 0.027U	1	
C708	ECUF1H392KBN	50V 3900P	1	
C709	ECUV1E563KBN	25V 0.056U	1	
C710	ECUE1H151KCN	50V 150P	1	
C711,12	ECUWNE104ZFN	25V 0.1U	2	
C713	ECUZNE104MBN	25V 0.1U	1	
C714	ECEA0JKA101I	6.3V 100U	1	
C715	ECUE1H182KBN	50V 1800P	1	
C716	ECUE1H821KBN	50V 820P	1	
C717	ECUWNE104ZFN	25V 0.1U	1	
C718	ECUVNC224KBN	16V 0.22U	1	
C721,22	ECUE1H100DCN	50V 10P	2	
C723	ECEA1AKA221I	10V 220U	1	
C724	ECUZNE104MBN	25V 0.1U	1	
C725,26	ECUE1H102KBN	50V 1000P	2	
C727,28	ECEA1HPK010I	50V 1U	2	
C730	ECUWNE104ZFN	25V 0.1U	1	
C731,32	ECEA0JKA221I	6.3V 220U	2	
C733	ECUZNE104MBN	25V 0.1U	1	
C734	ECEA1AKA221I	10V 220U	1	
C735-37	ECUWNE104ZFN	25V 0.1U	3	
C738	ECUZNE104MBN	25V 0.1U	1	
C739	ECUE1H102KBN	50V 1000P	1	
C742	ECUV1E273KBN	25V 0.027U	1	
C743	ECUWNE104ZFN	25V 0.1U	1	
C744	ECUE1E123KBN	25V 0.012U	1	
C745	ECUE1H102KBN	50V 1000P	1	
C747	ECUE1H221KBN	50V 220P	1	
C749	ECUE1H222KBN	50V 2200P	1	
C750,51	ECUZNE104MBN	25V 0.1U	2	
C753	ECUV1H471KBN	50V 470P	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
C754	ECUE1H471KBN	50V 470P	1	
C762	ECUE1H471KBN	50V 470P	1	
C790	ECA1AKF820E	10V 82U	1	
C801	ECBT1H102KB5	50V 1000P	1	
CN401	RJP6G17ZA	CONNECTOR(6P)	1	
CN402	RJS1A6223-1	CONNECTOR(23P)	1	
CN403,04	RJS1A6605	CONNECTOR(5P)	2	
CN405	RJS1A6606	CONNECTOR(6P)	1	
CN701	RJU035T016-1	SOCKET(16P)	1	
CN702	RJS1A6723-1Q	CONNECTOR(23P)	1	
CN801	RJU099W10	CONNECTOR(10P)	1	
CP403,04	RJS1A6605	CONNECTOR(5P)	2	
CP405	RJS1A6606	CONNECTOR(6P)	1	
CP790	RJP6G17ZA	CONNECTOR(6P)	1	
CP801	RJT099W10-1	CONNECTOR(10P)	1	
⚠ D401-03	RL1N4003N02	DIODE	3	
⚠ D404	MTZJ8R2BTA	DIODE	1	
D405,06	1SS254TA	DIODE	2	
D408-10	1SS254TA	DIODE	3	
⚠ D481	RL1N4003N02	DIODE	1	
⚠ D482	MTZJ5R1BTA	DIODE	1	
D801	SPR-305MDTF	LED	1	
⚠ IC401	LM2940T5M	IC	1	
IC402	T0TX178	IC	1	
IC403	LC66356C4K19	IC	1	
IC405	BA4558FHTT1	IC	1	
IC701	AN8837SBE1	IC	1	
IC702	MN662741RPA	IC	1	
IC703	AN8780NSBE2	IC	1	
IC790	TA7291S	IC	1	
JK401	RJT065K19	SYSTEM CONNECTOR(19P)	1	
⚠ L401,02	BL02RN2R65T2	COIL	2	
L406	ELEXT101KA9	COIL	1	
L408	BL02RN2R62T4	COIL	1	
L409	ELEXT1R0KA9	COIL	1	
L701,02	RLBN102V-Y	COIL	2	
Q401	2SC1740SRSTA	TRANSISTOR	1	
Q402	DTC143ESTP	TRANSISTOR	1	
Q403	2SC1740SRSTA	TRANSISTOR	1	
Q404	DTC114YSTP	TRANSISTOR	1	
⚠ Q405,06	2SD2137PQTA	TRANSISTOR	2	
Q408,09	DTA143XSTP	TRANSISTOR	2	
Q423	2SA933STA	TRANSISTOR	1	
Q701	2SB709STX	TRANSISTOR	1	
Q702	DTC114YKA146	TRANSISTOR	1	
R403	ERDS2FJ102	1/4W 1K	1	
R405	ERDS2FJ103	1/4W 10K	1	
R406	ERDS2TJ473T	1/4W 47K	1	
R407	ERDS2TJ223T	1/4W 22K	1	
R409,10	ERDS2FJ103	1/4W 10K	2	
R411	ERDS2TJ471T	1/4W 470	1	
R412	ERDS2FJ101	1/4W 100	1	
R413	ERDS2TJ471T	1/4W 470	1	
R414	ERDS2FJ102	1/4W 1K	1	
R415	ERDS2FJ105	1/4W 1M	1	
R423	ERDS2FJ472	1/4W 4.7K	1	
R427	ERDS2FJ472	1/4W 4.7K	1	
R428	ERDS2FJ103	1/4W 10K	1	
R429	ERDS2TJ471T	1/4W 470	1	
R430	ERDS2FJ104	1/4W 100K	1	
R431-34	ERDS2FJ103	1/4W 10K	4	
R435,36	ERDS2FJ104	1/4W 100K	2	
R439	ERDS2FJ101	1/4W 100	1	
R440	ERDS2FJ102	1/4W 1K	1	
⚠ R441	ERQ16NKWR15E	1/6W 0.15	1	
⚠ R442	ERDS1FVJ271T	1/2W 270	1	
⚠ R443	ERD2FCJ6R8	1/4W 6.8	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
R445,46	ERDS2TJ1R2T	1/4W 1.2	2	
R455,56	ERDS2TJ221T	1/4W 220	2	
R457	ERDS2TJ1R2T	1/4W 1.2	1	
R458	ERDSZFJ102	1/4W 1K	1	
R459,60	ERDS2TJ473T	1/4W 47K	2	
R471-74	ERDS2TJ391T	1/4W 390	4	
R475-77	ERDS2FJ103	1/4W 10K	3	
R481,82	ERDS2TJ271T	1/4W 270	2	
R483,84	ERDS2FJ102	1/4W 1K	2	
R485,86	ERDS2FJ104	1/4W 100K	2	
R487-90	ERDS2TJ223T	1/4W 22K	4	
R491,92	ERDS2TJ273T	1/4W 27K	2	
R493,94	ERDS2TJ332T	1/4W 3.3K	2	
R495,96	ERDS2FJ101	1/4W 100	2	
R497	ERDS2TJ182T	1/4W 1.8K	1	
R498	ERDS2FJ272	1/4W 2.7K	1	
R701	ERJ6GEYJ4R7Z	1/10W 4.7	1	
R702	ERJ6GEYJ822V	1/10W 8.2K	1	
R703	ERJ6GEYJ823Z	1/10W 82K	1	
R704	ERJ6GEYJ102A	1/10W 1K	1	
R705	ERJ6GEYJ124Z	1/10W 120K	1	
R706	ERJ6GEYJ102A	1/10W 1K	1	
R707	ERJ6GEYJ474Z	1/10W 470K	1	
R708	ERJ6GEYJ154V	1/10W 150K	1	
R709	ERJ6GEYJ473Z	1/10W 47K	1	
R710	ERJ6GEYJ103V	1/10W 10K	1	
R711	ERJ6GEYJ154V	1/10W 150K	1	
R712	ERJ6GEYJ221Z	1/10W 220	1	
R714	ERJ6GEYJ121Z	1/10W 120	1	
R715	ERJ6GEYJ122Z	1/10W 1.2K	1	
R717,18	ERJ6GEYJ102A	1/10W 1K	2	
R721	ERJ6GEYJ101Z	1/10W 100	1	
R722	ERJ6GEYJ563V	1/10W 56K	1	
R723	ERJ6GEYJ182V	1/10W 1.8K	1	
R724	ERJ6GEYJ333Z	1/10W 33K	1	
R725	ERJ6GEYJ122Z	1/10W 1.2K	1	
R726	ERJ6GEYJ473Z	1/10W 47K	1	
R727,28	ERJ6GEYJ682Z	1/10W 6.8K	2	
R729	ERJ6GEYJ562V	1/10W 5.6K	1	
R731	ERJ6GEYJ822V	1/10W 8.2K	1	
R735,36	ERJ6GEYJ101Z	1/10W 100	2	
R744	ERJ6GEYJ104Z	1/10W 100K	1	
R745	ERJ6GEYJ155Z	1/10W 1.5M	1	
R748	ERJ6GEYJ182V	1/10W 1.8K	1	
R749	ERJ6GEYJ682Z	1/10W 6.8K	1	
R752	ERJ8GEYJ220V	1/8W 22	1	
R810	ERDS2TJ821T	1/4W 820	1	
R811	ERDS2FJ102	1/4W 1K	1	
R812	ERDS2TJ122T	1/4W 1.2K	1	
R813	ERDS2TJ152T	1/4W 1.5K	1	
R814	ERDS2TJ182T	1/4W 1.8K	1	
R815	ERDS2FJ222	1/4W 2.2K	1	
R816	ERDS2TJ332T	1/4W 3.3K	1	
R817	ERDS2FJ472	1/4W 4.7K	1	
RJ701	ERJ6GEY0R00A	CHIP JUMPER	1	
RJ702-10	ERJ8GEY0R00A	CHIP JUMPER	9	
RJ715,16	ERJ8GEY0R00A	CHIP JUMPER	2	
RJ721,22	ERJ6GEY0R00A	CHIP JUMPER	2	
RJ724	ERJ6GEY0R00A	CHIP JUMPER	1	
RJ726-28	ERJ6GEY0R00A	CHIP JUMPER	3	
RJ731,32	ERJ6GEY0R00A	CHIP JUMPER	2	
RJ750	ERJ6GEY0R00A	CHIP JUMPER	1	
S701	RSH1A043-U	SW	1	
S790,91	RSH1A005	SW	2	
S801-09	EVQPTD05Q	SW	9	
SA1	SZZP1054C	TEST DISC	1	
SA2	RFKXEM30L	MOLYCOAT GREASE EM30L	1	
TJ701	EYF8CU	CHECKER CLIP	1	
X401	EFOEC4234T3	OSCILLATOR	1	
X701	RSXB16M9J02T	OSCILLATOR	1	

Cabinet Parts Location

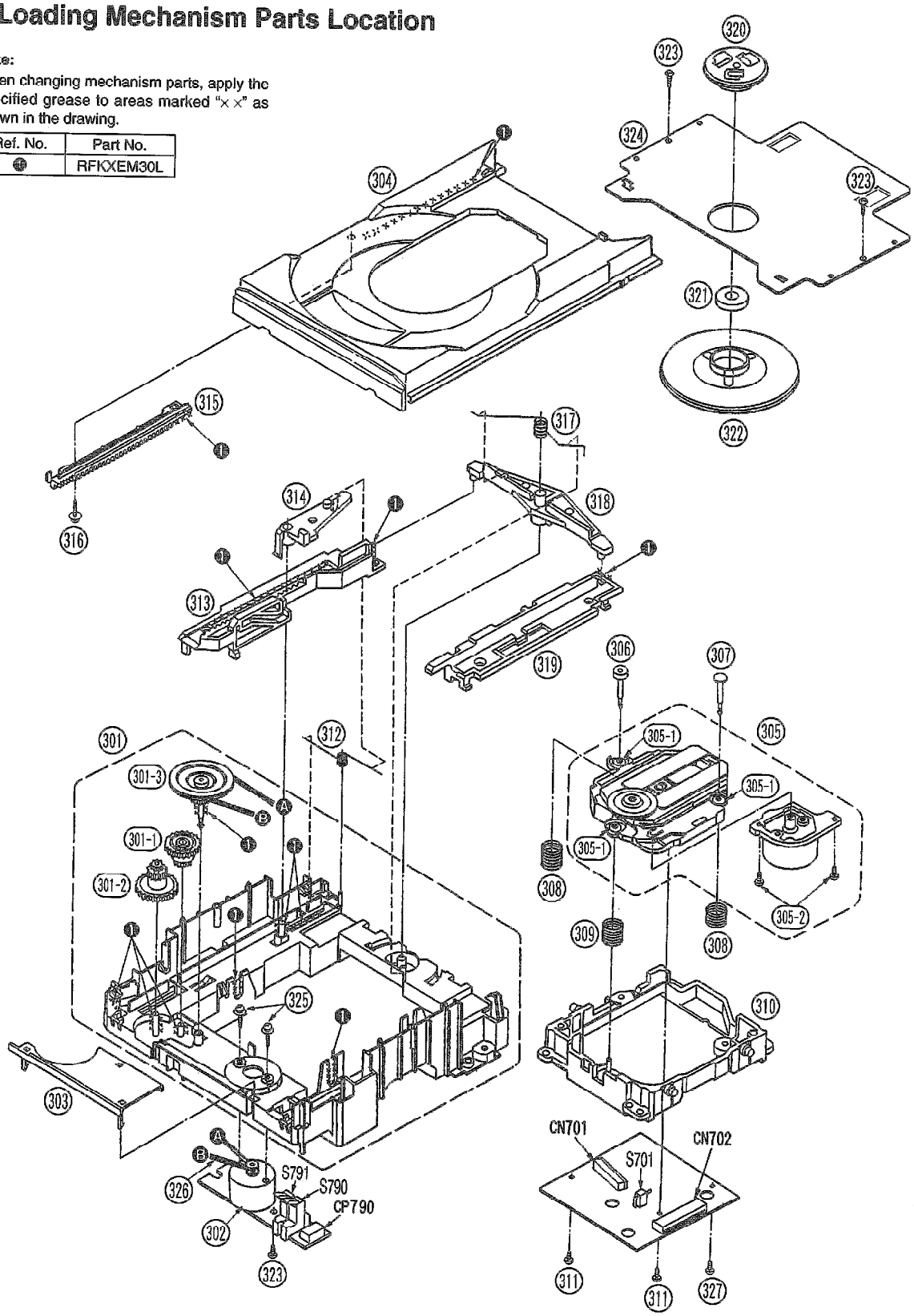


※Not supplies.

Loading Mechanism Parts Location

Note:
When changing mechanism parts, apply the specified grease to areas marked "× ×" as shown in the drawing.

Ref. No.	Part No.
⊕	RFKXEM30L



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